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1990

EPA Superfund
Record of Decision:

KASSAUF-KIMERLING BATTERY DISPOSAL
EPA ID: FLD980727820
OU 02
TAMPA, FL
03/30/1990

THE POST-FS AND EPA'S INITIAL PROPOSED PLAN FOR THE MARSH WAS RELEASED TO THE PUBLIC IN AUGUST 1989. THESE TWO DOCUMENTS WERE MADE AVAILABLE TO THE PUBLIC IN BOTH THE ADMINISTRATIVE RECORD AND IN THE INFORMATION REPOSITORY MAINTAINED AT THE EPA DOCKET ROOM IN REGION IV AND AT THE TAMPA - HILLSBOROUGH COUNTY PUBLIC LIBRARY. THE NOTICE OF AVAILABILITY OF THESE TWO DOCUMENTS WAS PUBLISHED IN THE TAMPA TRIBUNE ON AUGUST 28, 1989. A PUBLIC COMMENT PERIOD WAS HELD FROM AUGUST 23, 1989 THROUGH SEPTEMBER 27, 1989. IN ADDITION, A PUBLIC MEETING WAS HELD ON SEPTEMBER 6, 1989. AT THIS MEETING, REPRESENTATIVES FROM EPA AND THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATIONS (FDER) ANSWERED QUESTIONS ABOUT THE SITE AND THE PROPOSED REMEDY FOR THE MARSH.

AFTER THE MEETING, EPA AND FDER AGREED THAT A WETLAND IMPACT STUDY (A STUDY TO FURTHER DEFINE THE ECOLOGICAL IMPACT ON THE MARSH) SHOULD BE CONDUCTED BEFORE SELECTING AN ALTERNATIVE FOR THE MARSH. EPA'S WETLAND IMPACT STUDY WAS COMPLETED IN LATE JANUARY 1990 AND A COPY WAS PLACED IN THE PUBLIC INFORMATION REPOSITORY ON FEBRUARY 9, 1990. A MODIFIED PROPOSED PLAN WHICH REVISED THE REMEDY EPA HAD PROPOSED IN ITS INITIAL PROPOSED PLAN, WAS PLACED IN THE PUBLIC INFORMATION REPOSITORY ON FEBRUARY 9, 1990. THE PUBLIC COMMENT PERIOD ON THE MODIFIED PROPOSED PLAN WAS HELD FROM FEBRUARY 12 - MARCH 14, 1990. ON FEBRUARY 21, 1990, A PUBLIC MEETING WAS HELD TO PRESENT THE ALTERNATIVES FOR THE MARSH. EPA'S AND FDER'S RESPONSE TO THE COMMENTS RECEIVED DURING THE PUBLIC MEETING AND WRITTEN COMMENTS RECEIVED DURING THE COMMENT PERIOD IS INCLUDED IN THE RESPONSIVENESS SUMMARY (WHICH IS ATTACHED TO AND MADE A PART OF THIS RECORD OF DECISION).

THIS DECISION DOCUMENT PRESENTS THE SELECTED REMEDIAL ACTION FOR THE SECOND OPERABLE UNIT (THE WETLANDS) FOR THE KASSOUF-KIMERLING SITE, IN TAMPA, FLORIDA, CHOSEN IN ACCORDANCE WITH CERCLA, AS AMENDED BY SARA AND, TO THE EXTENT PRACTICABLE, THE NATIONAL CONTINGENCY PLAN. THE DECISION FOR THIS SITE IS BASED ON THE ADMINISTRATIVE RECORD.

#SROU
5.0 SCOPE AND ROLE OF OPERABLE UNIT

AS WITH MANY SUPERFUND SITES, THE PROBLEMS AT THE KASSOUF-KIMERLING SITE ARE COMPLEX. AS A RESULT, THE WORK HAS BEEN DIVIDED INTO SMALLER UNITS OR PHASES, REFERRED TO AS "OPERABLE UNITS". THE OPERABLE UNITS (OUS) AT THIS SITE ARE:

OU ONE: ADDRESSES CONTAMINATION OF THE LANDFILL WASTES.

OU TWO: ADDRESSES CONTAMINATION OF THE MARSH ADJACENT TO THE LANDFILL.

EPA PREVIOUSLY SELECTED A CLEANUP REMEDY FOR OU ONE (THE LANDFILL) IN EPA'S RECORD OF DECISION, DATED MARCH 31, 1989. OU ONE WILL ADDRESS THE SOURCE OF THE CONTAMINATION BY EXCAVATING, STABILIZING AND SOLIDIFYING THE LANDFILL WASTES AND CONTAMINATED UNDERLYING SOILS. THE SOLIDIFIED MATERIAL WILL BE LANDFILLED BACK INTO THE CURRENT DISPOSAL AREA. THE FUNCTION OF OU ONE IS TO IMMOBILIZE THE CONTAMINATION IN THE LANDFILL AND THEREBY REDUCE THE RISKS ASSOCIATED WITH EXPOSURE TO CONTAMINATED ON-SITE SOILS, GROUNDWATER, AND WASTES IN THE LANDFILL. IMPLEMENTATION OF OU ONE HAS BEEN POSTPONED UNTIL A REMEDY FOR OU TWO HAS BEEN SELECTED.

THE SECOND OU ADDRESSES THE CONTAMINATED MARSH SEDIMENTS. THE CLEANUP OBJECTIVES FOR THE SECOND OU ARE TO PREVENT CURRENT OR FUTURE EXPOSURE TO THE CONTAMINATED SEDIMENTS THROUGH TREATMENT AND/OR CONTAINMENT, AND TO REDUCE THE MIGRATION OF CONTAMINANTS.

#SSC
6.0 SUMMARY OF SITE CHARACTERIZATIONS

THE KASSOUF-KIMERLING BATTERY SITE CONSISTS OF A LANDFILL AREA ADJACENT TO A MARSH. SOIL, SEDIMENT, GROUND WATER AND SURFACE WATER SAMPLES WERE COLLECTED IN AND AROUND THE SITE. ALTHOUGH THE REMEDIAL INVESTIGATION (RI) IDENTIFIED GENERAL AREAS OF CONTAMINATION, IT WAS NOT

OF SUFFICIENT SCOPE TO THOROUGHLY DEFINE THE EXTENT OF CONTAMINATION IN THE SEDIMENTS AND SURFACE WATER OF THE ADJACENT WETLANDS. THEREFORE, ADDITIONAL FIELD INVESTIGATION STUDIES WERE CONDUCTED BY EPA TO CHARACTERIZE THE CONTAMINATION IN THE MARSH. THE FIELD INVESTIGATION STUDIES ARE INCLUDED IN THE POST-FS DOCUMENT, AND WERE USED TO IDENTIFY POTENTIAL REMEDIAL ALTERNATIVES. THE FIELD INVESTIGATIONS FOR THE MARSH INCLUDED THE FOLLOWING:

- WETLANDS CLASSIFICATION
- SURFACE WATER SAMPLING
- SEDIMENT SAMPLING
- SUBSURFACE SEDIMENT SAMPLING

IN ADDITION TO THE FIELD INVESTIGATIONS A WETLAND IMPACT STUDY WAS CONDUCTED TO PROVIDE THE BIOLOGICAL AND CHEMICAL INFORMATION (SEE SECTION 6.6) NECESSARY TO EVALUATE THE ECOLOGICAL HAZARDS ASSOCIATED WITH THE WETLAND CONTAMINANTS.

GEOLOGY

THE GEOLOGY OF THE SITE WAS FOUND TO BE REPRESENTATIVE AND TYPICAL OF THE TYPES OF DEPOSITS IDENTIFIED FOR THIS AREA OF FLORIDA. THE SITE LITHOLOGY IS REPRESENTED IN A GENERALIZED GEOLOGIC COLUMN OF THE TAMPA BYPASS CANAL AREA SHOWN IN FIGURE 6.1. THE SUBSURFACE DEPOSITS CONSISTS OF UNCONSOLIDATED SANDS, SILTY-SANDS, AND PEAT AT AND NEAR THE SURFACE SEPARATED FROM LIMESTONE BELOW BY A LOW HYDRAULIC CONDUCTIVITY CLAY LAYER INTERBEDDED WITH CLAYEY, LIMEY SANDS. CONSTANT HEAD HYDRAULIC CONDUCTIVITY TESTS OF THE CONFINING LAYER INDICATE THAT THE HYDRAULIC CONDUCTIVITY OF THIS DEPOSIT IS LOW AND RELATIVELY IMPERMEABLE TO GROUND WATER FLOW. THE LOW CONDUCTIVITY DEPOSITS AND ABUNDANCE OF CLAY, BOTH IN THE CONFINING LAYER AND IN THE UPPER PORTIONS OF THE FLORIDAN AQUIFER PROVIDE PROTECTION TO THE FLORIDAN AQUIFER WATER SUPPLIES FROM THE HAZARDOUS CONSTITUENTS FOUND ON SITE.

WETLANDS CLASSIFICATION

THE LANDFILL WAS DEPOSITED IN AND IS SURROUNDED BY AN EXTENSIVE WETLAND SYSTEM. THE ROAD BORDERING THE WEST SIDE OF THE LANDFILL (58TH STREET) GIVING ACCESS TO THE SITE WAS CONSTRUCTED THROUGH THIS WETLAND SYSTEM. SURFACE WATER FLOWS FROM THE WETLAND SYSTEM ON THE WEST SIDE OF THE LANDFILL THROUGH A CANAL UNDER 58TH STREET AND THROUGH THE LANDFILL INTO THE WETLAND ON THE EAST SIDE OF THE LANDFILL. STORMWATER RUNS EASTWARD OFF THE LANDFILL AND INTO THE WETLAND SYSTEM. THE LANDFILL HAS CONTAMINATED BOTH SURFACE WATER AND SEDIMENTS IN THE WETLAND TO THE EAST OF THE LANDFILL. APPROXIMATELY FOUR ACRES OF WETLAND SEDIMENTS ARE CONTAMINATED TO VARYING DEGREES WITH LEAD.

THE CONTAMINATED EAST WETLAND IS A DEPRESSIONAL, ISOLATED, SEMI-PERMANENTLY FLOODED PRIMROSE WILLOW SCRUB-SHRUB SWAMP LOCATED IN AN URBAN SETTING. THE DOMINANT WETLAND VEGETATION IS PRIMROSE WILLOW WITH AN UNDERSTORY OF WATER HYACINTH, SMARTWEED, BUTTONBUSH, AND CATTAIL. THE WETLAND SURFACE IS FLOODED WITH RAINWATER AND LOCAL UPLAND STORMWATER RUNOFF NORMALLY 80 PERCENT OF THE YEAR OR MORE.

THE EAST WETLAND EFFECTIVELY STORES FLOODWATERS AND SEDIMENTS FROM SURROUNDING AREAS (INCLUDING THE LANDFILL) DUE TO THE DEPRESSIONAL NATURE OF THE SYSTEM AND THE CONSTRICTION OF THE HIGHWATER OUTFLOW. THE WETLAND SERVES AS A CATCHMENT BASIN TRAPPING, HOLDING, AND ACCUMULATING CONTAMINATED SEDIMENTS. THE DENSE WETLAND VEGETATION CONTRIBUTES TO THIS EFFECT OF RETAINING SEDIMENTS AND ASSOCIATED CONTAMINANTS. THE WETLAND AREA IS AN IMPORTANT WILDLIFE HABITAT WITHIN THE URBAN SETTING DUE TO THE IRREGULAR SHAPE OF THE WETLAND, THE EXTENSIVE PERIMETER, THE DENSE VEGETATION, AND THE LONG HYDROPERIOD WHICH PROVIDES SHELTER AND FEEDING AREAS FOR BIRDS, SMALL MAMMALS, REPTILES, AND INVERTEBRATES.

SURFACE WATER

IN JANUARY 1987, ERM SOUTH COLLECTED SURFACE WATER SAMPLES FROM THE MARSH. THE ANALYTICAL DATA COLLECTED DURING THIS INVESTIGATION ARE SUMMARIZED IN TABLE 6.1 AND THE TOTAL LEAD CONCENTRATIONS FOR EACH LOCATION ARE DISPLAYED ON FIGURE 6.2.

IN MARCH 1989, EPA COLLECTED SURFACE WATER SAMPLES FROM THE MARSH. THE ANALYTICAL DATA COLLECTED DURING THE MARCH 1989 FIELD INVESTIGATION ARE SUMMARIZED IN TABLE 6.2 AND THE LEAD CONCENTRATIONS FOR EACH LOCATION ARE DISPLAYED ON FIGURE 6.3. LEAD WAS NOT DETECTED IN THE UPGRADIENT CANAL SAMPLE, KK-1W, OR THE BACKGROUND SAMPLE, KK-18W. LEAD WAS DETECTED IN NINE OF THE SAMPLES COLLECTED IN THE MARSH AT CONCENTRATIONS RANGING FROM 8 PPB IN SAMPLE KK-8W TO 1,800 PPB IN SAMPLE KK-4WD.

THE ROUTES BY WHICH THE LANDFILL IMPACTS THE WETLAND APPEAR TO BE THROUGH SURFACE WATER TRANSPORT, AND GROUNDWATER FLOW. WATER FLOWS OFF AND THROUGH THE LANDFILL IN A EASTERLY DIRECTION THUS PROVIDING A PATHWAY FOR METAL TRANSPORT INTO THE WETLAND. REMEDIATION OF THE LANDFILL AS PROVIDED FOR IN OPERABLE UNIT ONE WILL REMOVE THIS SOURCE OF ADDITIONAL CONTAMINATION.

GROUNDWATER

G&M INSTALLED EIGHT SHALLOW AQUIFER MONITORING WELLS ON SITE IN 1981 AND 1982. IN 1986 AND 1987, ERM SOUTH, INC. INSTALLED THREE OFFSITE SHALLOW AQUIFER WELLS, ONE FLORIDAN AQUIFER WELL AND SEVERAL SHALLOW PIEZOMETERS. MONITORING OF BOTH THE SURFICIAL AND FLORIDAN AQUIFERS DURING THE COURSE OF THE INVESTIGATION INDICATED THAT THERE IS LITTLE OR NO POTENTIAL FOR MOVEMENT OF GROUND WATER FROM THE SURFICIAL AQUIFER SYSTEM TO THE FLORIDAN AQUIFER SYSTEM. THE LACK OF A DOWNWARD FLOW COMPONENT IN THE SURFICIAL AQUIFER, COUPLED WITH THE GENERALLY LOW HYDRAULIC CONDUCTIVITIES AND HIGH CLAY CONTENT OF THE CONFINING LAYERS BENEATH THE SURFICIAL AQUIFER, EFFECTIVELY PREVENTS MIGRATION OF HEAVY METALS DOWNWARD INTO THE FLORIDAN AQUIFER. NO SITE IMPACTS WERE FOUND IN THE OFF-SITE SURFICIAL OR FLORIDAN AQUIFER WELLS OR IN DOWNGRADIENT PRIVATE WELLS.

MARSH SEDIMENTS

IN SEPTEMBER 1986, ERM SOUTH COLLECTED SEDIMENT SAMPLES FROM THE MARSH. THE ANALYTICAL DATA COLLECTED DURING THIS INVESTIGATION ARE SUMMARIZED IN THE TOP HALF OF TABLE 6.3 AND THE LEAD CONCENTRATIONS FOR EACH LOCATION ARE DISPLAYED ON FIGURE 6.4 THE CONCENTRATIONS OF LEAD FOR THIS FIELD INVESTIGATION RANGED FROM 8.77 PPM TO 17,741 PPM.

IN JANUARY 1987, ERM SOUTH RESAMPLED THE MARSH. THE ANALYTICAL DATA COLLECTED DURING THIS INVESTIGATION ARE SUMMARIZED IN THE BOTTOM HALF OF TABLE 6.3 AND THE LEAD CONCENTRATIONS FOR EACH LOCATION ARE DISPLAYED ON FIGURE 6.5. THE CONCENTRATIONS OF LEAD FOR THIS INVESTIGATION RANGED FROM 6.14 PPM TO 3,142 PPM.

IN MAY 1988, ERM SOUTH COLLECTED SEDIMENT SAMPLES FROM THE CANAL IN THE MARSH. THE ANALYTICAL DATA IS SUMMARIZED IN TABLE 6.4 AND THE LEAD CONCENTRATIONS FOR EACH LOCATION IN THE CANAL ARE DISPLAYED ON FIGURE 6.6.

THE LEAD CONCENTRATION IN THE CANAL ARE HIGHEST NEXT TO THE LANDFILL AND DECREASE WITH DISTANCE AWAY FROM THE LANDFILL. THE CONCENTRATIONS OF LEAD IN THE CANAL RANGED FROM 23 PPM TO 3,350 PPM NEXT TO THE LANDFILL.

IN MARCH 1989, EPA COLLECTED SEDIMENT SAMPLES FROM THE MARSH. THE ANALYTICAL DATA COLLECTED DURING THIS INVESTIGATION ARE SUMMARIZED IN TABLE 6.5 AND THE LEAD CONCENTRATIONS ARE DISPLAYED

FOR EACH LOCATION OF FIGURE 6.7. THE CONCENTRATIONS OF LEAD RANGED FROM 9.5 PPM IN THE UPGRADIENT CANAL SAMPLE, KK-1S, TO 4,000 PPM IN SAMPLE KK-7S WITHIN THE MARSH. THE BACKGROUND SAMPLE, KK-18S, CONTAINED 12 PPM OF LEAD.

IN JUNE 1989, EPA COLLECTED SUBSURFACE SEDIMENT SAMPLES FROM FOUR (4) LOCATIONS IN THE MARSH. THE ANALYTICAL DATA IS SUMMARIZED IN TABLE 6.6 AND THE SAMPLE LOCATIONS ARE SHOWN ON FIGURE 6.8. THE 0 TO 1 FOOT BELOW LAND SURFACE (BLS) CONTAINED LEAD CONCENTRATIONS RANGING FROM 18 PPM TO 730 PPM. THE 1 TO 2 FEET BLS CONTAINED LESS LEAD THAN THE 0 TO 1 FOOT BLS INTERVAL; THE CONCENTRATIONS RANGED FROM 6.1 PPM TO 130 PPM. THREE OF THE 2 TO 3 FEET BLS SAMPLES CONTAINED LEAD; THE CONCENTRATIONS RANGED FROM 4.1 PPM TO 38 PPM. ALL OF THE SAMPLE COLLECTED BELOW 3 FEET BLS CONTAINED NO DETECTABLE CONCENTRATIONS OF LEAD.

WETLAND IMPACT STUDY

IN SEPTEMBER OF 1989, THE ECOLOGICAL SUPPORT BRANCH OF EPA REGION IV, CONDUCTED A WETLAND IMPACT STUDY ON THE KASSOUF-KIMERLING SITE. THE OVERALL GOAL OF THE STUDY WAS TO PROVIDE THE BIOLOGICAL AND CHEMICAL INFORMATION NECESSARY TO EVALUATE THE ECOLOGICAL HAZARDS ASSOCIATED WITH THE WETLAND CONTAMINANTS. FIELD, LABORATORY, AND MODELING EXERCISES THAT WERE UNDERTAKEN WERE DESIGNED TO PROVIDE INFORMATION ON:

1. THE EXISTING HEALTH OF THE WETLAND COMMUNITY AS MEASURED BY BIOSURVEY TECHNIQUES.

2. THE TOXICITY OF WETLAND SURFACE WATERS TO AQUATIC ORGANISMS.

3. THE TOXICITY OF SEDIMENT SAMPLES AND SEDIMENT ELUATES TO TERRESTRIAL AND AQUATIC ORGANISMS, RESPECTIVELY, UNDER DIVERSE ENVIRONMENTAL CONDITIONS, RELATIVE TO THE METAL CONCENTRATIONS IN THE SAMPLES.

4. THE FATE OF THE METALS IN THE SYSTEM AS PREDICTED BY A GEOCHEMICAL SPECIATION MODEL.

5. THE EXISTING LEVEL OF METAL BIOACCUMULATION BY INDIGENOUS PLANTS AND ANIMALS.

THE STUDY REPORTED THAT VIRTUALLY ALL THE STATIONS SAMPLED DEMONSTRATED SOME DEGREE OF TOXICITY ASSOCIATED WITH THE SURFACE WATER. OF THE METALS ASSESSED IN THE STUDY, LEAD WAS THE ONLY METAL CLEARLY EXCEEDING AMBIENT WATER QUALITY CRITERIA.

THE STUDY WENT ON TO STATE THAT A LEVEL OF 40 MG/KG OF LEAD IN THE MARSH SEDIMENTS WAS AN APPROPRIATE CLEAN-UP OBJECTIVE TO ASSURE COMPLIANCE WITH THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC). THE REPORT CONCLUDED THAT TRYING TO ACHIEVE THE 40 MG/KG IN THE MARSH SEDIMENTS MIGHT RESULT IN THE MOBILIZATION OF LEAD, ULTIMATELY HAVING A NEGATIVE ENVIRONMENTAL IMPACT ON THE MARSH.

FINALLY, THE STUDY RECOMMENDED CHANGING THE WETLAND'S HYDROPERIOD FROM A SEMI-PERMANENTLY FLOODED MARSH SYSTEM TO A PERMANENTLY FLOODED MARSH SYSTEM. UNDER FLOODED CONDITIONS THE WETLAND SEDIMENTS BECOME ANAEROBIC WITH THE OVERLYING WATER COLUMN OFTEN FEATURING A SUBSTANDARD LEVEL OF DISSOLVED OXYGEN. THE SULFUR BACTERIA IN THE SEDIMENTS REDUCE SULFATE TO SULFIDE WHICH REACTS WITH MOST HEAVY METALS TO FORM A METALLIC SULFIDE. UNDER ANAEROBIC OR REDUCED CONDITIONS IN THE SEDIMENTS, THE METALS ARE SEQUESTERED.

#SSRW

7.0 SUMMARY OF SITE RISKS FOR THE WETLANDS:

BOTH HUMAN AND ENVIRONMENTAL RISKS WERE EVALUATED FOR THE WETLANDS AREA ADJACENT TO THE KASSOUF-KIMERLING SITE. DUE TO THE SENSITIVITY OF THE ECOLOGICAL COMMUNITY TO THE CONTAMINANTS OF CONCERN IN THE WETLANDS, THE ENVIRONMENTAL IMPACTS OVERRIDE THE HUMAN HEALTH RISKS FOR THE MARSH AREA. THE RISK EVALUATION FOR THE WETLANDS IS BASED ON THE WETLANDS IMPACT STUDY CONDUCTED FOR THE ADJACENT WETLAND.

IDENTIFICATION OF THE CONTAMINANTS OF CONCERN:

SURFACE WATER ANALYSES INDICATE THAT SEVERAL METALS WERE PRESENT ABOVE BACKGROUND LEVELS. VIOLATIONS OF THE FEDERAL AMBIENT WATER QUALITY CRITERIA FOR AQUATIC LIFE AND ITS USERS OCCURRED FOR LEAD, CADMIUM, COPPER, ZINC AND ALUMINUM. DATA FROM THE MARSH AREA INDICATES THAT THE HIGH LEAD CONCENTRATION IN THIS AREA MAKE IT THE CONTAMINANT WHICH WILL DETERMINE THE EXTENT OF THE REMEDIATION IN THE WETLANDS.

ANALYSIS OF THE MARSH SEDIMENTS ALSO SHOWED SEVERAL METALS WERE PRESENT IN THE SEDIMENTS ABOVE BACKGROUND LEVELS. LEAD WAS CLEARLY THE MOST CONCENTRATED CONTAMINATE IN THE SEDIMENTS WITH VALUES RANGING FROM 17,741 PPM NEXT TO THE LANDFILL TO 8.77 PPM ON THE EAST SIDE OF THE MARSH. SPATIAL VARIABILITY OF LEAD LEVELS WAS ALSO INDICATED BY THE SEDIMENT SAMPLES. IN THE SEDIMENT PROFILE, LEAD LEVELS DECREASED BELOW ONE FOOT IN DEPTH AND HAD UNDETECTABLE CONCENTRATIONS BELOW THREE FEET IN DEPTH.

EXPOSURE ASSESSMENT SUMMARY

THE EXPOSURE ASSESSMENT FOR THE MARSH IS DIVIDED INTO TWO POSSIBLE EXPOSURE PATHWAYS, HUMAN AND ENVIRONMENTAL.

HUMAN EXPOSURE PATHWAYS IN THE MARSH:

THE EXPOSURE PATHWAYS FOR HUMANS IN THE MARSH ARE PRESENTED IN TABLE 7.1. POTENTIALLY EXPOSED POPULATIONS ARE ADULTS AND CHILDREN RESIDING IN OR FREQUENTING THE AREA. POTENTIAL EXPOSURE PATHWAYS TO CONTAMINATED MEDIA ARE SUMMARIZED BELOW:

SURFACE WATER

- DERMAL EXPOSURE DURING CASUAL OR ACCIDENTAL CONTACT

SEDIMENTS

- DERMAL CONTACT WITH SEDIMENTS
- INGESTION OF SEDIMENTS

PATHWAYS ELIMINATED FROM FURTHER CONSIDERATION:

THE PATHWAYS WHICH WERE NOT CONSIDERED TO BE COMPLETE EXPOSURE PATHWAYS ARE SUMMARIZED BELOW:

GROUND WATER (SHALLOW AQUIFER)

- CONCENTRATIONS OF INDICATOR CHEMICALS WERE BELOW EPA MCLS AND FLORIDA CHAPTER 17-22 GROUND WATER STANDARDS

GROUND WATER (FLORIDAN AQUIFER)

- CONCENTRATIONS OF INDICATOR CHEMICALS WERE BELOW EPA MCLS AND FLORIDA CHAPTER 17-22 GROUND WATER STANDARDS

SURFACE WATER

- NO KNOWN INGESTION
- NO INHALATION EXPOSURE SINCE THE INDICATOR CHEMICALS WERE INORGANIC, HENCE, NONVOLATILE

SEDIMENTS (DISCHARGE FROM MARSH)

- NO INHALATION EXPOSURE VIA VOLATILIZATION, SINCE THE INDICATOR CHEMICALS WERE INORGANIC AND HENCE NONVOLATILE
- NO INHALATION EXPOSURES DUE TO THE FUGITIVE DUST EMISSIONS SINCE THESE ARE NOT ANTICIPATED CONDITIONS OF THE MARSH AREA.

ASSUMPTIONS MADE:

HUMAN INGESTION OF FISH WAS NOT CONSIDERED APPROPRIATE FOR THIS MARSH BECAUSE IT DOES NOT SUPPORT GAME FISH. THE ONLY FISH POPULATION CONSIST OF SMALL MINNOWS IN THE CANAL.

SINCE THE MARSH NORMALLY HAS LESS THAN ONE FOOT OF WATER AND IS DENSELY VEGETATED, SWIMMING WAS NOT CONSIDERED APPROPRIATE. HOWEVER, HUMANS WADING IN THE MARSH COULD POSSIBLY OCCUR.

ENVIRONMENTAL EXPOSURE PATHWAYS IN THE MARSH:

AQUATIC BIOTA MAY BE EXPOSED VIA CONTAMINATED SURFACE WATER AND SEDIMENTS. THE WETLANDS IMPACT STUDY INDICATES THAT THERE IS A TENDENCY FOR FISH TO BIOACCUMULATE THE METALS. HIGHER ORGANISMS IN THE FOOD CHAIN MAY BE EXPOSED THROUGH INGESTION OF AQUATIC ORGANISMS AND/OR PLANTS WHICH HAVE BEEN EXPOSED TO THE MARSH CONTAMINATION.

SUMMARY OF THE AQUATIC TOXICITY ASSESSMENT OF THE CONTAMINANTS OF CONCERN

1. BASED ON THE EXISTING TOXICOLOGICAL DATA, LEVELS OF HEAVY METAL ACCUMULATION (CD, CR AND PB) IN THE FLORA AND FAUNA OF THE SITE POSE A POTENTIAL LONG-TERM RISK TO RESIDENT CONSUMERS OF THE SITE WETLAND. AQUATIC PLANT CONCENTRATIONS OF LEAD PRESENT THE GREATEST RISK TO WILDLIFE.

2. THE BIOSURVEY OF THE MARSH INDICATES THAT THE COMMUNITY OF BENTHIC MACROINVERTEBRATES ASSOCIATED WITH THE CANAL AND SURROUNDING WETLAND AREA ARE SEVERELY RESTRICTED IN DIVERSITY.

3. VIRTUALLY ALL STATIONS STUDIED DURING THE WETLANDS IMPACT STUDY SHOWED SOME DEGREE OF TOXICITY ASSOCIATED WITH SURFACE WATER. THE MOST PRONOUNCED EFFECTS WERE EXHIBITED NEAREST THE LANDFILL. BOTH ACUTE AND CHRONIC EFFECTS WERE OBSERVED NEAR THE LANDFILL.

4. BIOACCUMULATION VARIES GREATLY DEPENDING ON NUMEROUS FACTORS, BUT CHIEFLY APPEARS TO DEPEND ON THE SPECIES AFFECTED. FISH REPRESENT A MOBILE POPULATION WHICH CAN MIGRATE FROM OTHER LOCATIONS. PLANTS LACK THIS MOBILITY AND HENCE REPRESENT SITE EFFECTS. AQUATIC PLANTS IN THE MARSH SHOWED BIOACCUMULATION OF METALS.

5. IMPACTS TO FRESHWATER PLANTS INCLUDE GROWTH REDUCTION AND MORTALITY.

RISK CONCLUSIONS:

BASED ON THE WETLANDS IMPACT STUDY THE MARSH CONTAMINANTS ARE HAVING A NEGATIVE IMPACT ON THE ECOLOGY OF THE MARSH (SEE SECTION 7.3 TOXICITY ASSESSMENT). THE STUDY CONCLUDES THAT A LEVEL OF

40 MG/KG OF LEAD IN THE MARSH SEDIMENTS WOULD BE AN APPROPRIATE CLEAN-UP OBJECTIVE TO ASSURE COMPLIANCE WITH THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC). HOWEVER, THE REPORT FURTHER CONCLUDES THAT TRYING TO ACHIEVE THE 40 MG/KG IN THE MARSH SEDIMENTS MIGHT RESULT IN THE MOBILIZATION OF LEAD, ULTIMATELY HAVING A GREATER NEGATIVE ENVIRONMENTAL IMPACT ON THE MARSH.

THE ROUTES BY WHICH THE KASSOUF-KIMERLING SITE IMPACTS THE WETLAND IS THROUGH SURFACE WATER TRANSPORT, AND GROUNDWATER FLOW. WATER FLOWS OFF AND THROUGH THE LANDFILL, IN AN EASTERLY DIRECTION THUS PROVIDING A PATHWAY FOR METAL TRANSPORT INTO THE WETLAND. REMEDIATION OF THE LANDFILL SITE WILL REDUCE THE LEVELS OF LEAD IN THE SURFACE WATER TO AN INSIGNIFICANT AMOUNT.

FINALLY, THE WETLAND IMPACT STUDY RECOMMENDED CHANGING THE WETLAND'S HYDROPERIOD FROM A SEMI-PERMANENTLY FLOODED MARSH SYSTEM TO A PERMANENTLY FLOODED MARSH SYSTEM. UNDER FLOODED CONDITIONS THE WETLAND SEDIMENTS BECOME ANAEROBIC WITH THE OVERLYING WATER COLUMN OFTEN FEATURING A SUBSTANDARD LEVEL OF DISSOLVED OXYGEN. THE SULFUR BACTERIA IN THE SEDIMENTS REDUCE SULFATE TO SULFIDE WHICH REACTS WITH MOST HEAVY METALS TO FORM A METALLIC SULFIDE. ANAEROBIC OR REDUCED CONDITIONS IN THE SEDIMENTS WILL CAUSE THE METALS TO BE SEQUESTERED AND WILL REDUCE THE POTENTIAL FOR MIGRATION OF METALS.

#DA

8.0 DESCRIPTION OF ALTERNATIVES

ALTERNATIVE 1 - NO ACTION
ALTERNATIVE 2 - LOW PERMEABILITY COVER
ALTERNATIVE 3 - SOLIDIFICATION
MODIFIED ALTERNATIVE 3 - SOLIDIFICATION
ALTERNATIVE 4 - OFF-SITE DISPOSAL

ALTERNATIVE 1 - NO ACTION

THE SUPERFUND PROGRAM REQUIRES THAT THE "NO-ACTION" ALTERNATIVE BE CONSIDERED AT EVERY SITE. UNDER THE "NO-ACTION" ALTERNATIVE, EPA WOULD TAKE NO FURTHER ACTION AT THE SITE TO CONTROL THE SOURCE OF CONTAMINATION. THE "NO-ACTION" ALTERNATIVE SERVES AS A BASELINE WITH WHICH OTHER ALTERNATIVES CAN BE COMPARED. POTENTIAL HEALTH RISKS WOULD REMAIN ASSOCIATED WITH CURRENT EXPOSURE BY INGESTION TO MARSH SEDIMENTS AND EXPOSURE TO SURFACE WATER BY INGESTION. THIS ALTERNATIVE EXCEEDS THE TARGET RISK RANGE AND DOES NOT ATTAIN ARARS.

THE NO ACTION ALTERNATIVE IMPLIES LEAVING THE SITE IN ITS PRESENT CONDITION WITHOUT DISTURBING CONTAMINATED SEDIMENTS. ASSOCIATED WITH THE NO ACTION ALTERNATIVE WOULD BE CONTINUED MONITORING OF THE MARSH SEDIMENTS, SURFACE WATER AND GROUNDWATER QUALITY AT THE SITE.

ALSO INCLUDED IN THIS ALTERNATIVE IS THE INSTALLATION OF A FENCE AROUND THE PERIMETER OF THE WETLANDS. WARNING SIGNS WOULD BE POSTED ON THE FENCE AND LAND USE RESTRICTIONS WOULD BE IMPOSED ON THE SITE TO PREVENT ADDITIONAL AREAS OF CONTAMINATION.

SOLIDIFICATION WAS THE SOLICITED REMEDY FOR THE FIRST OPERABLE UNIT (THE LANDFILL PORTION) OF THE KASSOUF-KIMERLING SITE. SECTION 404(B)(1) OF THE CLEAN WATER ACT WOULD REQUIRE MITIGATION FOR THE DESTROYED WETLANDS IN THE LANDFILL AREA.

A PUBLIC HEALTH ASSESSMENT WOULD BE PERFORMED EVERY FIVE YEARS TO EVALUATE POTENTIAL CHANGES IN RISK ASSOCIATED WITH NO ACTION AND MONITORING WOULD CONTINUE FOR 30 YEARS.

THE ESTIMATED PRESENT WORTH COST OF THIS ALTERNATIVE IS $232,900 WHICH INCLUDES $157,600 FOR OPERATION AND MAINTENANCE.

ALTERNATIVE 2 - LOW PERMEABILITY COVER

CONSTRUCTION OF A LOW PERMEABILITY (CLAY) COVER WOULD INVOLVE THE PLACEMENT OF CLAY AND TOPSOIL OVER AREAS OF CONTAMINATED MARSH SEDIMENTS THAT EXCEED THE ESTABLISHED SOIL CLEANUP GOALS. DUE TO THE ABSENCE OF "CLEAN" CLAY FILL ON-SITE, APPROXIMATELY 16,000 CUBIC YARDS OF CLAY WOULD BE HAULED TO THE SITE AND PLACED OVER THE AREA OF SEDIMENT CONTAMINATION. APPROXIMATELY TWO FEET OF THIS LOW HYDRAULIC CONDUCTIVITY MATERIAL WOULD BE PLACED, COMPACTED, AND THEN COVERED WITH A ONE-FOOT LAYER OF VEGETATIVE FILL. AGAIN, DUE TO THE ABSENCE OF ACCEPTABLE TOPSOIL MATERIAL ON-SITE, APPROXIMATELY 8,000 CUBIC YARDS OF THIS MATERIAL WOULD BE HAULED TO THE SITE.

SECTION 404(B)(1) OF THE CLEAN WATER ACT REQUIRES THAT PRACTICABLE STEPS MUST BE TAKEN TO MINIMIZE ADVERSE IMPACTS TO WETLANDS CAUSED BY FILLING IN WETLANDS. TO ACHIEVE NO NET LOSS OF WETLANDS, AND TO MINIMIZE THE ADVERSE EFFECTS OF FILLING AT THE SITE, MITIGATION IS REQUIRED WHICH INVOLVES REPLACING WETLANDS LOST AT THE SITE BY CREATING OR RESTORING A WETLAND AREA. A SITE SPECIFIC MITIGATION PLAN FOR THE SELECTED ALTERNATIVE WILL BE DEVELOPED IN ACCORDANCE WITH THE EPA REGIONAL MITIGATION GUIDELINES.

DRAINAGE DIVERSION DITCHES WOULD BE CONSTRUCTED AROUND THE CAPPED AREA TO PROMOTE RUNOFF OF SURFACE WATER AND AWAY FROM THE CAPPED AREA. LAND USE RESTRICTIONS WOULD BE IMPOSED ON THE SITE TO PREVENT ADDITIONAL AREAS OF CONTAMINATION.

MONITORING OF GROUNDWATER QUALITY OF THE SITE WOULD BE PERFORMED QUARTERLY FOR A PERIOD OF FOUR YEARS AND SEMI-ANNUALLY FOR 26 YEARS THEREAFTER. A PUBLIC HEALTH ASSESSMENT WOULD BE CONDUCTED BY EPA FIVE YEARS AFTER IMPLEMENTATION OF THE REMEDIAL ACTION TO EVALUATE POTENTIAL CHANGES IN RISK ASSOCIATED WITH THE SITE.

THE TOTAL PRESENT WORTH COST FOR THIS ALTERNATIVE IS ESTIMATED TO BE $679,600 WHICH INCLUDES $157,600 FOR OPERATION AND MAINTENANCE.

ALTERNATIVE 3 - SOLIDIFICATION/STABILIZATION

SOLIDIFICATION/STABILIZATION OF CONTAMINATED MARSH SEDIMENT WOULD INITIALLY INVOLVE THE EXCAVATION OF APPROXIMATELY 16,000 CUBIC YARDS OF CONTAMINATED SEDIMENTS. FOR COMPARISON PURPOSES, IT WAS ASSUMED THAT SEDIMENTS DOWN TO TWO FEET BELOW GROUND SURFACE WOULD REQUIRE TREATMENT. GIVEN THE RELATIVE IMMOBILITY OF LEAD, IT IS UNLIKELY THAT SIGNIFICANT LEVELS OF CONTAMINANTS HAVE MIGRATED GREATER THAN ONE FOOT BELOW GROUND SURFACE. HOWEVER, THE PRESENCE OF HEAVY EARTH MOVING EQUIPMENT COULD CAUSE MIXING OF THE MARSH SEDIMENTS FORCING CONTAMINANTS TO DEPTHS OF TWO FEET. ALSO, THE VOID FORMED AS THE VEGETATION IS REMOVED FROM THE ROOT ZONE COULD ALLOW THE CONTAMINANTS TO MOVE DEEPER. SAMPLING WILL BE PERFORMED DURING REMEDIATION TO CONFIRM ACTUAL LATERAL AND VERTICAL EXTENSION OF SEDIMENT CONTAMINATION.

MIXING OF THE SEDIMENTS WITH STABILIZING AGENTS WOULD BE PERFORMED ON-SITE AND ABOVE-GRADE. THE MIXED MATERIAL WOULD BE PLACED WITH THE LANDFILL SOLIDIFIED MATERIAL. PRECAUTION WOULD BE TAKEN TO MINIMIZE THE DESTRUCTION OF THE WETLANDS BY CONTAINING THE SOLIDIFIED MATERIALS IN ONE AREA. A 12-INCH THICK LAYER OF TOPSOIL WOULD BE PLACED OVER THE SOLIDIFIED MASS AND VEGETATED WITH GRASS. DUE TO THE LACK OF ACCEPTABLE TOPSOIL ON-SITE, APPROXIMATELY 8,000 CUBIC YARDS OF MATERIAL WOULD BE HAULED TO THE SITE.

FEDERAL EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS, REQUIRES FEDERAL AGENCIES IN CARRYING OUT THEIR RESPONSIBILITIES TO TAKE ACTION TO MINIMIZE THE DESTRUCTION, LOSS, OR DEGRADATION OF WETLANDS, AND TO PRESERVE AND ENHANCE THERE NATURAL AND BENEFICIAL VALUES OF WETLANDS. SECTION 404(B)(1) OF THE CLEAN WATER ACT ALSO REQUIRES THAT PRACTICABLE STEPS MUST BE TAKEN TO MINIMIZE ADVERSE IMPACTS TO WETLANDS CAUSED BY FILLING. ONE TYPE OF MINIMIZATION IS COMPENSATORY MITIGATION TO ACHIEVE NO NET LOSS OF WETLANDS, AND TO MINIMIZE THE ADVERSE EFFECTS OF FILLING AT

THE SITE, WHICH INVOLVES REPLACING WETLANDS LOST AT THE SITE BY CREATING OR RESTORING A NEW WETLAND AREA. A SITE SPECIFIC MITIGATION PLAN FOR THE SELECTED ALTERNATIVE WILL BE DEVELOPED IN ACCORDANCE WITH THE EPA REGIONAL MITIGATION GUIDELINES.

MONITORING OF GROUNDWATER QUALITY OF THE SITE WOULD BE PERFORMED QUARTERLY FOR A PERIOD OF FOUR YEARS. THE SURFACE WATER STANDARDS MAY NOT BE INITIALLY MET BUT WOULD ACHIEVE THESE STANDARDS OVER A SHORT PERIOD OF TIME DUE TO THE EXCAVATION AND SOLIDIFICATION OF THE MARSH SEDIMENTS AND THE LANDFILL MATERIAL. A PUBLIC HEALTH ASSESSMENT WOULD BE CONDUCTED BY EPA FIVE YEARS AFTER REMEDIAL ACTION IMPLEMENTATION. FOLLOWING THIS ASSESSMENT, MONITORING ACTIVITIES WOULD BE TERMINATED, PROVIDED THAT THE PUBLIC HEALTH ASSESSMENT DOES NOT IDENTIFY A NEED FOR FURTHER REMEDIAL ACTION OR MONITORING.

TREATABILITY OR BENCH SCALE STUDIES WOULD BE NECESSARY DURING REMEDIAL DESIGN TO DETERMINE WHICH SOLIDIFICATION AGENTS ARE MOST EFFECTIVE FOR THE KASSOUF-KIMERLING SITE. FOR COSTING PURPOSES, PORTLAND CEMENT WAS ASSUMED.

THE TOTAL PRESENT WORTH COST FOR THIS ALTERNATIVE IS ESTIMATED TO BE $1,745,470 WHICH INCLUDES $59,950 FOR OPERATION AND MAINTENANCE.

MODIFIED ALTERNATIVE 3 - SOLIDIFICATION

BASED ON THE WETLAND IMPACT STUDY A MODIFICATION OF ALTERNATIVE 3 WAS DEVELOPED. AS PREVIOUSLY STATED IN SECTION 6.6, THE WETLAND IMPACT STUDY CONCLUDED THAT 40 MG/KG OF LEAD IN THE MARSH SEDIMENTS WAS AN APPROPRIATE CLEAN-UP OBJECTIVE TO ASSURE COMPLIANCE WITH THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC). THE AWQC IS AN ALLOWABLE SURFACE WATER CONCENTRATION OF LEAD THAT WILL PROTECT AQUATIC LIFE FROM CHRONIC LEAD TOXICITY. FOR THE KASSOUF-KIMERLING SITE THE AWQC CONCENTRATION WAS CALCULATED TO BE 4.6 UG/L FOR LEAD IN THE SURFACE WATER. HOWEVER, THE WETLAND IMPACT STUDY REPORTED THAT TRYING TO ACHIEVE THE 40 MG/KG IN THE MARSH SEDIMENTS MIGHT RESULT IN THE MOBILIZATION OF LEAD, AND ULTIMATELY HAVE A NEGATIVE ENVIRONMENTAL IMPACT ON THE MARSH. AS STATED IN THE ALTERNATIVE 3, MOBILIZATION OF LEAD COULD BE CAUSED BY THE USE OF HEAVY EARTH MOVING EQUIPMENT MIXING THE MARSH SEDIMENTS AND FORCING THE CONTAMINANTS DEEPER INTO THE PEAT SEDIMENTS. SIMILARLY, THE VOID FORMED AS THE VEGETATION IS REMOVED FROM THE ROOT ZONE COULD ALLOW THE CONTAMINANTS TO MOVE DEEPER. THE EARTH MOVING EQUIPMENT COULD SUSPEND LEAD PARTICULATES THAT ARE BOND TO THE MARSH SEDIMENTS, INTO THE WATER COLUMN THUS ALLOWING LEAD TO MIGRATE FROM THE MARSH. THEREFORE A LESS RADICAL APPROACH WOULD BE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT BY NOT POTENTIALLY MOBILIZING THE METALS IN THE MARSH TO A GREATER EXTENT.

THE MODIFIED ALTERNATIVE 3 WOULD REMOVE THE MARSH SEDIMENT WITHIN 20 FEET OF THE BATTERY LANDFILL TO A DEPTH OF TWO FEET BELOW THE SEDIMENT SURFACE. THE SEDIMENTS ALONG THE EDGE OF THE LANDFILL CONTAIN HIGH CONCENTRATIONS OF LEAD WHICH HAVE MIGRATED FROM THE LANDFILL PORTION OF THE SITE. IN ADDITION, THE SEDIMENTS WOULD BE REMOVED FROM THE CANAL EAST OF THE SITE EXTENDING 150 FEET FROM THE BATTERY LANDFILL AND TO A DEPTH OF TWO FEET BELOW THE SEDIMENT SURFACE. THE CANAL SEDIMENTS ALSO CONTAIN HIGH CONCENTRATIONS OF METALS THAT HAVE BEEN TRANSPORTED A GREATER DISTANCE DUE TO THE FLOW IN THE CANAL. APPROXIMATELY 1,500 CUBIC YARDS OF CONTAMINATED SEDIMENTS WILL BE EXCAVATED FROM THE MARSH. THE EXCAVATED SEDIMENTS WILL BE TREATED USING A SOLIDIFICATION AND STABILIZATION TECHNOLOGY AND PLACED WITH THE SOLIDIFIED LANDFILL MATERIAL. THE REMAINDER OF THE MARSH SEDIMENTS (SEDIMENTS GREATER THAN 20 FEET AWAY FROM THE LANDFILL AND SEDIMENTS IN THE CANAL GREATER THAN 150 FEET AWAY FROM THE LANDFILL) WOULD BE LEFT IN PLACE. THE CANAL WHICH CURRENTLY ALLOWS THE MARSH TO DRAIN WILL BE DESIGNED TO ALLOW THE MARSH TO REMAIN FLOODED YEAR ROUND. THE WETLAND IMPACT STUDY CONCLUDED THAT IF THE MARSH WAS PERMANENTLY FLOODED, INSTEAD OF ITS CURRENT SEMI-PERMANENTLY FLOODED CONDITION, THE HAZARDOUS METALS IN THE SEDIMENTS WOULD REMAIN UNDER ANAEROBIC CONDITIONS AND WOULD BE CHEMICALLY BOUND AND SEQUESTERED IN THE SEDIMENTS.

THERE IS A POSSIBILITY THAT BY LEAVING CONTAMINATED SEDIMENTS IN THE MARSH EXCEEDING THE CLEAN-UP GOAL OF 40 MG/KG FOR LEAD, THAT THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC) IN SURFACE WATER MAY BE EXCEEDED.

IN ORDER TO SELECT THIS ALTERNATIVE A WAIVER OF THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC) IS REQUIRED. THE WAIVER IS JUSTIFIED BY THE POTENTIAL NEGATIVE ENVIRONMENTAL IMPACT THAT COULD BE CREATED BY TRYING TO REMEDIATE THE REMAINDER OF THE MARSH SEDIMENTS WHICH INVOLVES COMPLETE DESTRUCTION OF THE WETLAND AND POTENTIAL MOBILIZATION OF LEAD BEYOND THE SITE AREA (CERCLA 121(D)(4)(B)).

THIS MODIFIED ALTERNATIVE DOES NOT REQUIRE A WAIVER OF FLORIDA ADMINISTRATIVE CODE CHAPTER 17-3, MAXIMUM CONCENTRATION LIMITS (MCLS) FOR THE GROUNDWATER OR SURFACE WATER. THE ROUTES BY WHICH THE LANDFILL IMPACTS THE WETLAND IS THROUGH SURFACE WATER TRANSPORT, AND GROUNDWATER FLOW. WATER FLOWS OFF AND THROUGH THE LANDFILL IN AN EASTERLY DIRECTION THUS PROVIDING A PATHWAY FOR METAL TRANSPORT INTO THE WETLAND. REMEDIATION OF THE LANDFILL SITE WOULD LEAD TO INSIGNIFICANT METAL LOADINGS TO THE WETLANDS.

MONITORING OF GROUNDWATER AND SURFACE WATER AT THE SITE WOULD BE PERFORMED QUARTERLY FOR A PERIOD OF FOUR YEARS. IT IS POSSIBLE THAT THE FLORIDA ADMINISTRATIVE CODE CHAPTER 17-3 MAXIMUM CONTAMINANT LEVELS (MCL) FOR CLASS III SURFACE WATER BODIES MAY NOT BE INITIALLY MET. HOWEVER, THESE STANDARDS WILL BE ACHIEVED OVER A SHORT PERIOD OF TIME BECAUSE THE SOURCE OF CONTAMINATION (THE LANDFILL) WILL NO LONGER EXIST. A PUBLIC HEALTH ASSESSMENT WOULD BE CONDUCTED BY EPA FIVE YEARS AFTER REMEDIAL ACTION IMPLEMENTATION. FOLLOWING THIS ASSESSMENT, MONITORING ACTIVITIES WOULD BE TERMINATED, PROVIDED THAT THE PUBLIC HEALTH ASSESSMENT DOES NOT IDENTIFY A NEED FOR FURTHER REMEDIAL ACTION OR MONITORING.

FEDERAL EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS, REQUIRES FEDERAL AGENCIES IN CARRYING OUT THEIR RESPONSIBILITIES TO TAKE ACTION TO MINIMIZE THE DESTRUCTION, LOSS, OR DEGRADATION OF WETLANDS, AND TO PRESERVE AND ENHANCE THERE NATURAL AND BENEFICIAL VALUES OF WETLANDS. SECTION 404(B)(1) OF THE CLEAN WATER ACT ALSO REQUIRES THAT PRACTICABLE STEPS MUST BE TAKEN TO MINIMIZE ADVERSE IMPACTS TO WETLANDS FROM FILL. IN THE CASE OF THIS ALTERNATIVE, THE CONTAMINATED SEDIMENTS REMAINING IN THE MARSH WILL CONTINUE TO IMPAIR THE BIOLOGICAL PRODUCTIVITY AND DIVERSITY OF THE WETLAND ECOSYSTEM. TO MINIMIZE THE EFFECTS OF THIS IMPACT, MITIGATION IS REQUIRED TO CREATE NEW AREAS OF WETLANDS THAT WILL REPLACE THE FUNCTIONS LOST IN THE ON-SITE WETLAND. A SITE SPECIFIC MITIGATION PLAN WILL BE DEVELOPED AS PART OF THE REMEDIAL DESIGN AND IN ACCORDANCE WITH THE EPA REGIONAL MITIGATION GUIDELINES.

TREATABILITY OR BENCH SCALE STUDIES WILL BE NECESSARY DURING REMEDIAL DESIGN TO DETERMINE WHICH SOLIDIFICATION AGENTS ARE MOST EFFECTIVE FOR THE KASSOUF-KIMERLING SITE. FOR COSTING PURPOSES, IT WAS ASSUMED THAT PORTLAND CEMENT WOULD BE USED.

THE TOTAL PRESENT WORTH COST FOR THIS ALTERNATIVE IS ESTIMATED TO BE $511,700 WHICH INCLUDES $99,950 FOR OPERATION AND MAINTENANCE.

ALTERNATIVE 4 - OFF-SITE DISPOSAL

OFF-SITE DISPOSAL WOULD INVOLVE THE EXCAVATION OF APPROXIMATELY 16,000 CUBIC YARDS OF CONTAMINATED MARSH SEDIMENTS DOWN TO TWO FEET BELOW GROUND SURFACE. ACTUAL EXTENT AND DEPTH OF CONTAMINATED SEDIMENT TO BE EXCAVATED WOULD BE DETERMINED DURING REMEDIATION.

EXCAVATED WASTES WOULD BE STOCKPILED IN A STAGING AREA THAT WOULD SERVE AS A PLACE FOR LOADING AND DECONTAMINATION. WASTES SHOULD NOT REQUIRE STOCKPILING FOR MORE THAN TWO OR THREE DAYS; THUS, NO SPECIAL PADS OR DRAINAGE DEVICES WOULD BE REQUIRED.

THE WASTES WOULD BE MANIFESTED BY A LICENSED HAZARDOUS WASTE HAULER AND TRANSPORTED TO AN APPROVED RCRA SUBTITLE C HAZARDOUS WASTE LANDFILL.

ONCE EXCAVATION ACTIVITIES HAVE BEEN COMPLETED, THE EXCAVATED AREA WOULD BE BACKFILLED WITH CLEAN MATERIAL HAULED IN FROM AN OFF-SITE LOCATION AND THE GROUND SURFACE RESTORED TO ITS ORIGINAL CONTOUR.

SECTION 404(B)(1) OF THE CLEAN WATER ACT REQUIRES THAT PRACTICABLE STEPS MUST BE TAKEN TO MINIMIZE ADVERSE IMPACTS TO WETLANDS. TO ACHIEVE NO NET LOSS OF WETLANDS, AND TO MINIMIZE THE ADVERSE EFFECTS OF DREDGING AND FILLING AT THE SITE, MITIGATION IS REQUIRED WHICH INVOLVES REPLACING WETLANDS LOST AT THE SITE BY CREATING A NEW WETLAND AREA. A SITE SPECIFIC MITIGATION PLAN WILL BE DEVELOPED IN ACCORDANCE WITH THE EPA REGIONAL MITIGATION GUIDELINES.

MONITORING OF GROUNDWATER QUALITY OF THE SITE WOULD BE PERFORMED QUARTERLY FOR A PERIOD OF FOUR YEARS. THE SURFACE WATER STANDARDS MAY NOT BE INITIALLY MET BUT WOULD ACHIEVE THESE STANDARDS WOULD BE ACHIEVED OVER A SHORT PERIOD OF TIME DUE TO THE EXCAVATION OF THE MARSH SEDIMENTS. A PUBLIC HEALTH ASSESSMENT WOULD BE CONDUCTED BY EPA FIVE YEARS AFTER REMEDIAL ACTION IMPLEMENTATION. FOLLOWING THIS ASSESSMENT, MONITORING ACTIVITIES WOULD BE TERMINATED, PROVIDED THAT THE PUBLIC HEALTH ASSESSMENT DOES NOT IDENTIFY A NEED FOR FURTHER REMEDIAL ACTION OR MONITORING.

THIS ALTERNATIVE WOULD COMPLY WITH FEDERAL AND STATE ARARS BUT WOULD IGNORE SARA'S PREFERENCE FOR TREATMENT. TRANSPORTATION OF ALL CONTAMINATED SOIL WOULD BE IN ACCORDANCE WITH APPROPRIATE FEDERAL AND STATE REGULATIONS. THE DISPOSAL FACILITY WOULD BE IN COMPLIANCE WITH ALL ARARS.

THE TOTAL PRESENT WORTH COST FOR THIS ALTERNATIVE IS ESTIMATED TO BE $4,737,280 WHICH INCLUDES $59,950 FOR OPERATION AND MAINTENANCE.

#SCAA

9.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

THIS SECTION PROVIDE THE BASIS FOR DETERMINING WHICH ALTERNATIVE PROVIDES THE "BEST BALANCE" OF TRADE-OFFS WITH RESPECT TO THE EVALUATION CRITERION. A GLOSSARY OF THE EVALUATION CRITERIA IS OFFERED IN TABLE 9.1.

OVERALL PROTECTION

ALL OF THE ALTERNATIVES, WITH THE EXCEPTION OF THE "NO ACTION" ALTERNATIVE, WOULD PROVIDE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT BY ELIMINATING, REDUCING, OR CONTROLLING RISK THROUGH TREATMENT, ENGINEERING CONTROLS, OR INSTITUTIONAL CONTROLS. THE MODIFIED ALTERNATIVE 3 OFFERS REDUCTION OF RISK BY TREATING THE HIGHLY CONTAMINATED MARSH SEDIMENTS WHILE NOT INTRODUCING NEW ENVIRONMENTAL RISKS BY ATTEMPTING TO REMEDIATE THE ENTIRE WETLAND. AS STATED EARLIER, BY PERMANENTLY FLOODING THE MARSH, THE HAZARDOUS METALS IN THE MARSH WOULD REMAIN CHEMICALLY BOUND IN THE SEDIMENTS.

BECAUSE THE "NO ACTION" ALTERNATIVE OFFERS NO REDUCTION IN RISK TO HUMAN HEALTH AND THE ENVIRONMENT, IT IS NOT CONSIDERED FURTHER IN THIS ANALYSIS AS AN OPTION FOR THIS SITE.

COMPLIANCE WITH ARARS

THE MODIFIED ALTERNATIVE 3 REQUIRES A WAIVER OF THE FEDERAL AMBIENT WATER QUALITY CRITERIA DUE TO THE POTENTIAL NEGATIVE ENVIRONMENTAL IMPACT THAT COULD BE CREATED BY TRYING TO REMEDIATE THE ENTIRE MARSH TO THE CLEAN-UP GOAL (40 MG/KG FOR LEAD). THE OTHER ALTERNATIVES DID NOT TAKE INTO CONSIDERATION THE MOBILITY OF LEAD DURING REMEDIATION (THE WETLAND IMPACT STUDY WAS COMPLETED

AFTER THE POST-FS). OFF-SITE DISPOSAL INVOLVES COMPLIANCE WITH ADDITIONAL ARARS ASSOCIATED WITH THE TRANSPORTATION OF HAZARDOUS MATERIALS.

LONG-TERM EFFECTIVENESS AND PERMANENCE

SOLIDIFICATION PROVIDES THE GREATEST DEGREE OF LONG-TERM ELIMINATION OF RISK POSED BY CONTAMINANTS AT THE KASSOUF-KIMERLING SITE BECAUSE THE CONTAMINANTS ARE PERMANENTLY BOUND IN A CEMENT MATRIX. THE LOW PERMEABILITY COVER ALTERNATIVE WOULD ALSO PROVIDE LONG-TERM PROTECTION TO PUBLIC HEALTH AND THE ENVIRONMENT; HOWEVER THERE IS A VERY SLIGHT CHANCE THAT FLOOD EVENTS MIGHT OCCUR WHICH COULD COMPROMISE THE INTEGRITY OF THE CAP. THE CAP'S EFFECTIVENESS WOULD BE EVALUATED THROUGH LONG-TERM MONITORING. OFF-SITE DISPOSAL MERELY TRANSFERS THE RISK TO ANOTHER LOCATION BUT WOULD OFFER SOME PROTECTION BY PROPER DISPOSAL IN A PERMITTED HAZARDOUS WASTE FACILITY.

REDUCTION OF TOXICITY, MOBILITY, OR VOLUME OF THE CONTAMINANTS THROUGH TREATMENT

THE MODIFIED ALTERNATIVE 3, SOLIDIFICATION, WOULD PROVIDE A SIGNIFICANT REDUCTION OF TOXICITY THROUGH TREATMENT OF THE HIGHLY CONTAMINATED SEDIMENTS. THIS ALTERNATIVE WOULD ALSO PROVIDE PROTECTION TO THE ENVIRONMENT BY NOT POTENTIALLY MOBILIZING THE METALS TO A GREATER EXTENT. SOLIDIFICATION WOULD PROVIDE A SIGNIFICANT REDUCTION OF CONTAMINANT MOBILITY BY BINDING THE CONTAMINANTS INTO A CEMENT MATRIX. ALTERNATIVES 2 (LOW PERMEABILITY COVER) AND 4 (OFF-SITE DISPOSAL) DO NOT PROVIDE FOR A REDUCTION OF TOXICITY OR VOLUME OF THE CONTAMINANTS BUT WOULD REDUCE THEIR MOBILITY.

SHORT-TERM EFFECTIVENESS

ALL OF THE ALTERNATIVES WOULD IMMEDIATELY BREAK THE SOIL INGESTION EXPOSURE PATHWAY WITH THE EXCEPTION OF THE MODIFIED ALTERNATIVE 3, WHICH WOULD ALLOW SOME SEDIMENTS THAT EXCEED THE CLEAN-UP GOAL TO REMAIN IN PLACE. MINIMAL RISK IS ASSOCIATED WITH REMEDY CONSTRUCTION FOR EACH ALTERNATIVE; HOWEVER, SOLIDIFICATION AND OFF-SITE DISPOSAL WOULD REQUIRE ADDITIONAL PRECAUTIONARY MEASURES TO ENSURE THE SAFETY OF WORKERS. OFF-SITE DISPOSAL ADDS A SLIGHT RISK TO THE GENERAL PUBLIC DUE TO HAULING ACTIVITIES. GIVEN THE RELATIVE IMMOBILITY OF SITE CONTAMINANTS AND THE MEDIA THAT THEY ARE CONTAINED IN (SOIL), THIS RISK WOULD BE MINIMAL IN THE EVENT OF AN ACCIDENT DURING TRANSPORTATION.

COST

OFF-SITE DISPOSAL IS ESTIMATED TO BE THE MOST EXPENSIVE REMEDIATION ALTERNATIVE AT $4,737,280. THE COST FOR THE MODIFIED ALTERNATIVE 3 IS SUBSTANTIALLY LESS THAN THE COST FOR ALTERNATIVE 3, AND MAY PROVIDE A GREATER PROTECTION TO THE ENVIRONMENT BY NOT POTENTIALLY MOBILIZING THE LEAD IN THE MARSH. THE TOTAL PRESENT WORTH OF THE MODIFIED ALTERNATIVE 3 IS $511,700 AS COMPARED TO ALTERNATIVE 3, WHICH IS $1,745,470.

STATE ACCEPTANCE

THE STATE OF FLORIDA AS REPRESENTED BY THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION CONCURS THAT THE MODIFIED ALTERNATIVE 3 IS THE PREFERRED ALTERNATIVE FOR REMEDIATING THE WETLAND AT THE KASSOUF-KIMERLING SITE.

COMMUNITY ACCEPTANCE

BASED ON COMMENTS MADE BY CITIZENS AT THE PUBLIC MEETING HELD ON FEBRUARY 21, 1990, AND THOSE RECEIVED DURING THE PUBLIC COMMENT PERIOD, THE COMMUNITY BELIEVES THE SELECTED REMEDY WILL EFFECTIVELY PROTECT HUMAN HEALTH AND THE ENVIRONMENT.

#SR
10.0 SELECTED REMEDY

BASED UPON CONSIDERATION OF THE REQUIREMENTS OF CERCLA, THE DETAILED ANALYSIS OF THE ALTERNATIVES, AND PUBLIC COMMENTS, EPA HAS DETERMINED THAT MODIFIED ALTERNATIVE 3 SOLIDIFICATION, STABILIZATION, AND ON-SITE DISPOSAL, IS THE MOST APPROPRIATE REMEDY FOR THE SECOND OPERABLE UNIT (THE WETLANDS) AT THE KASSOUF-KIMERLING SITE IN TAMPA, FLORIDA. THE MODIFIED ALTERNATIVE 3 WILL REMOVE THE MARSH SEDIMENT WITHIN 20 FEET OF THE LANDFILL TO A DEPTH OF TWO FEET BELOW THE SEDIMENT SURFACE. THE SEDIMENTS ALONG THE EDGE OF THE LANDFILL CONTAIN HIGH CONCENTRATIONS OF LEAD WHICH HAVE MIGRATED FROM THE LANDFILL PORTION OF THE SITE. IN ADDITION, THE SEDIMENTS WILL BE REMOVED FROM THE CANAL EAST OF THE SITE EXTENDING 150 FEET FROM THE BATTERY LANDFILL AND TO A DEPTH OF TWO FEET BELOW THE SEDIMENT SURFACE. THE CANAL SEDIMENTS ALSO CONTAIN HIGH CONCENTRATIONS OF METALS THAT HAVE BEEN TRANSPORTED A GREATER DISTANCE DUE TO THE FLOW IN THE CANAL. APPROXIMATELY 1,500 CUBIC YARDS OF CONTAMINATED SEDIMENTS WILL BE EXCAVATED FROM THE MARSH. THE EXCAVATED SEDIMENTS WILL BE TREATED USING A SOLIDIFICATION AND STABILIZATION TECHNOLOGY AND PLACED WITH THE SOLIDIFIED LANDFILL MATERIAL.

THE REMAINDER OF THE MARSH SEDIMENTS (SEDIMENTS GREATER THAN 20 FEET AWAY FROM THE LANDFILL AND SEDIMENTS IN THE CANAL GREATER THAN 150 FEET AWAY FROM THE LANDFILL) WILL BE LEFT IN PLACE. THE WETLAND IMPACT STUDY CONCLUDED THAT TRYING TO ACHIEVE THE CLEAN-UP GOAL (40 MG/KG OF LEAD) IN THE MARSH SEDIMENTS MIGHT RESULT IN THE MOBILIZATION OF LEAD, ULTIMATELY HAVING A NEGATIVE ENVIRONMENTAL IMPACT ON THE MARSH. MOBILIZATION OF LEAD COULD BE CAUSED BY THE USE OF HEAVY EARTH MOVING EQUIPMENT MIXING THE MARSH SEDIMENTS AND FORCING THE CONTAMINANTS DEEPER INTO THE PEAT SEDIMENTS. SIMILARLY, THE VOID FORMED AS THE VEGETATION IS REMOVED FROM THE ROOT ZONE COULD ALLOW THE CONTAMINANTS TO MOVE DEEPER. THE EARTH MOVING EQUIPMENT COULD SUSPEND LEAD PARTICULATES THAT ARE BOND TO THE MARSH SEDIMENTS, INTO THE WATER COLUMN THUS ALLOWING LEAD TO MIGRATE OFF-SITE.

THE CANAL WHICH CURRENTLY ALLOWS THE MARSH TO DRAIN WILL BE DESIGNED TO ALLOW THE MARSH TO REMAIN FLOODED YEAR ROUND, CHANGING THE WETLAND'S HYDROPERIOD FROM A SEMI-PERMANENTLY FLOODED MARSH SYSTEM TO A PERMANENTLY FLOODED MARSH SYSTEM. UNDER FLOODED CONDITIONS THE WETLAND SEDIMENTS BECOME ANAEROBIC WITH THE OVERLYING WATER COLUMN OFTEN FEATURING A SUBSTANDARD LEVEL OF DISSOLVED OXYGEN. THE SULFUR BACTERIA IN THE SEDIMENTS REDUCE SULFATE TO SULFIDE WHICH REACTS WITH MOST HEAVY METALS TO FORM A METALLIC SULFIDE. UNDER ANAEROBIC OR REDUCED CONDITIONS IN THE SEDIMENTS, THE METALS ARE SEQUESTERED. THE WETLAND SERVES AS A CATCHMENT BASIN TRAPPING, HOLDING, AND ACCUMULATING CONTAMINATED SEDIMENTS. THE DENSE WETLAND VEGETATION CONTRIBUTES TO THIS EFFECT OF RETAINING SEDIMENTS AND ASSOCIATED CONTAMINANTS.

THERE IS A POSSIBILITY THAT BY LEAVING CONTAMINATED SEDIMENTS IN THE MARSH EXCEEDING THE CLEAN-UP GOAL OF 40 MG/KG FOR LEAD, THAT THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC) IN SURFACE WATER MAY BE EXCEEDED. THEREFORE, THIS ALTERNATIVE REQUIRES A WAIVER OF THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC). THE WAIVER IS JUSTIFIED BY THE POTENTIAL NEGATIVE ENVIRONMENTAL IMPACT THAT COULD BE CREATED BY TRYING TO REMEDIATE THE REMAINDER OF THE MARSH SEDIMENTS WHICH INVOLVES COMPLETE DESTRUCTION OF THE WETLAND AND POTENTIAL MOBILIZATION OF LEAD BEYOND THE SITE AREA (CERCLA 121(D)(4)(B)).

THIS MODIFIED ALTERNATIVE DOES NOT REQUIRE A WAIVER OF FLORIDA ADMINISTRATIVE CODE CHAPTER 17-3, MAXIMUM CONCENTRATION LIMITS (MCLS) FOR THE GROUNDWATER OR SURFACE WATER. THE ROUTES BY WHICH THE LANDFILL IMPACTS THE WETLAND IS THROUGH SURFACE WATER TRANSPORT, AND GROUNDWATER FLOW. WATER FLOWS OFF AND THROUGH THE LANDFILL IN AN EASTERLY DIRECTION THUS PROVIDING A PATHWAY FOR METAL TRANSPORT INTO THE WETLAND. REMEDIATION OF THE LANDFILL SITE WOULD LEAD TO INSIGNIFICANT METAL LOADINGS TO THE WETLANDS.

MONITORING OF GROUNDWATER AND SURFACE WATER AT THE SITE WILL BE PERFORMED QUARTERLY FOR A PERIOD

OF FOUR YEARS. THE FLORIDA ADMINISTRATIVE CODE CHAPTER 17-3 MAXIMUM CONTAMINANT LEVELS (MCL) FOR CLASS III SURFACE WATER BODIES MAY NOT BE INITIALLY MET. HOWEVER, THESE STANDARDS WILL BE ACHIEVED OVER A SHORT PERIOD OF TIME BECAUSE THE SOURCE OF CONTAMINATION (THE LANDFILL) WILL NO LONGER EXIST. A PUBLIC HEALTH ASSESSMENT WILL BE CONDUCTED BY EPA FIVE YEARS AFTER REMEDIAL ACTION IMPLEMENTATION. FOLLOWING THIS ASSESSMENT, MONITORING ACTIVITIES WILL BE TERMINATED, PROVIDED THAT THE PUBLIC HEALTH ASSESSMENT DOES NOT IDENTIFY A NEED FOR FURTHER REMEDIAL ACTION OR MONITORING.

FEDERAL EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS, REQUIRES FEDERAL AGENCIES IN CARRYING OUT THEIR RESPONSIBILITIES TO TAKE ACTION TO MINIMIZE THE DESTRUCTION, LOSS, OR DEGRADATION OF WETLANDS, AND TO PRESERVE AND ENHANCE THERE NATURAL AND BENEFICIAL VALUES OF WETLANDS. SECTION 404(B)(1) OF THE CLEAN WATER ACT ALSO REQUIRES THAT PRACTICABLE STEPS MUST BE TAKEN TO MINIMIZE ADVERSE IMPACTS TO WETLANDS FROM FILL. IN THE CASE OF THIS ALTERNATIVE, THE CONTAMINATED SEDIMENTS REMAINING IN THE MARSH WILL CONTINUE TO IMPAIR THE BIOLOGICAL PRODUCTIVITY AND DIVERSITY OF THE WETLAND ECOSYSTEM. TO MINIMIZE THE EFFECTS OF THIS IMPACT, MITIGATION FOR THE ENTIRE WETLAND (APPROXIMATELY FOUR ACRES) IS REQUIRED. CREATION OF A NEW AREA OF WETLANDS WILL COMPENSATE FOR THE FUNCTIONS LOST OR EFFECTED IN THE ON-SITE WETLAND. A SITE SPECIFIC MITIGATION PLAN WILL BE DEVELOPED IN ACCORDANCE WITH THE EPA REGIONAL MITIGATION GUIDELINES.

TREATABILITY OR BENCH SCALE STUDIES WILL BE CONDUCTED DURING REMEDIAL DESIGN TO DETERMINE WHICH SOLIDIFICATION AGENTS ARE MOST EFFECTIVE FOR THE KASSOUF-KIMERLING SITE. FOR COSTING PURPOSES, PORTLAND CEMENT WAS ASSUMED.

THE TOTAL PRESENT WORTH COST FOR THIS ALTERNATIVE IS ESTIMATED TO BE $511,700 WHICH INCLUDES $99,950 FOR OPERATION AND MAINTENANCE.

#SD

11.0 STATUTORY DETERMINATIONS

UNDER ITS LEGAL AUTHORITIES, EPA'S PRIMARY RESPONSIBILITY AT SUPERFUND SITES IS TO UNDERTAKE REMEDIAL ACTIONS THAT ACHIEVE ADEQUATE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. IN ADDITION, SECTION 121 OF CERCLA ESTABLISHES SEVERAL OTHER STATUTORY REQUIREMENTS AND PREFERENCES. THESE SPECIFY THAT, WHEN COMPLETE, THE SELECTED REMEDIAL ACTION FOR THIS SITE MUST COMPLY WITH APPLICABLE OR RELEVANT AND APPROPRIATE ENVIRONMENTAL STANDARDS ESTABLISHED UNDER FEDERAL AND STATE ENVIRONMENTAL LAWS UNLESS A STATUTORY WAIVER IS JUSTIFIED. THE SELECTED REMEDY ALSO MUST BE COST-EFFECTIVE AND UTILIZE PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE. FINALLY, THE STATUTE INCLUDES A PREFERENCE FOR REMEDIES THAT EMPLOY TREATMENT THAT PERMANENTLY AND SIGNIFICANTLY REDUCE THE VOLUME, TOXICITY, OR MOBILITY OF HAZARDOUS WASTES AS THEIR PRINCIPAL ELEMENT. THE FOLLOWING SECTIONS DISCUSS HOW THE SELECTED REMEDY MEETS THESE STATUTORY REQUIREMENTS.

PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

THE SELECTED REMEDY PROTECTS HUMAN HEALTH AND THE ENVIRONMENT THROUGH SOLIDIFICATION OF THE GROSS CONTAMINATED MARSH SEDIMENTS ALONG THE EDGE OF THE LANDFILL AND SEDIMENTS IN THE CANAL. BY SOLIDIFYING THE HIGHLY CONTAMINATED SEDIMENTS, THE RISK OF EXPOSURE THROUGH DIRECT CONTACT WILL BE REDUCED.

THE ROUTES BY WHICH THE LANDFILL IMPACTS THE WETLAND IS THROUGH SURFACE WATER TRANSPORT AND GROUNDWATER FLOW. WATER FLOWS OFF AND THROUGH THE LANDFILL IN AN EASTERLY DIRECTION THUS PROVIDING A PATHWAY FOR METAL TRANSPORT INTO THE WETLAND. REMEDIATION OF THE LANDFILL SITE WILL LEAD TO INSIGNIFICANT METAL LOADINGS TO THE WETLANDS.

ALSO, BY CHANGING THE WETLAND'S HYDROPERIOD FROM A SEMI-PERMANENTLY FLOODED MARSH SYSTEM TO A PERMANENTLY FLOODED MARSH SYSTEM, THE CONDITIONS IN THE WETLAND SEDIMENTS BECOME ANAEROBIC. THE SULFUR BACTERIA IN THE SEDIMENTS REDUCE SULFATE TO SULFIDE WHICH REACTS WITH MOST HEAVY METALS TO FORM A METALLIC SULFIDE. UNDER ANAEROBIC OR REDUCED CONDITIONS IN THE SEDIMENTS, THE METALS IN THE REMAINDER OF THE MARSH (SEDIMENTS NOT TREATED BY SOLIDIFICATION) ARE CHEMICALLY BOUND AND SEQUESTERED IN THE SEDIMENTS AND WOULD NO LONGER POSE A THREAT TO HUMAN HEALTH OR THE ENVIRONMENT.

ATTAINMENT OF THE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR)

THE SELECTED REMEDY REQUIRES A WAIVER OF THE FEDERAL AMBIENT WATER QUALITY CRITERIA BECAUSE A PORTION OF THE MARSH SEDIMENTS WILL BE LEFT IN PLACE THAT EXCEED A RECOMMENDED CLEAN-UP GOAL OF 40 MG/KG OF LEAD. THE WAIVER IS JUSTIFIED BY THE POTENTIAL NEGATIVE ENVIRONMENTAL IMPACT THAT COULD BE CREATED BY TRYING TO REMEDIATE THE REMAINDER OF THE MARSH SEDIMENTS (SEDIMENTS GREATER THAN 20 FEET AWAY FROM THE LANDFILL AND SEDIMENTS IN THE CANAL GREATER THAN 150 FEET FROM THE LANDFILL) (CERCLA 121(D)(4)(B)).

THE SELECTED REMEDY WILL MEET OR EXCEED THE FOLLOWING ARARS, AS DISCUSSED BELOW.

RESOURCE CONSERVATION AND RECOVERY ACT

1. 40 CFR PART 264 SUBPART X - MISCELLANEOUS TREATMENT UNIT

2. 40 CFR PART 261 LAND BAN - THE RCRA LAND DISPOSAL RESTRICTIONS ("LDR") (40 CFR 268) PROMULGATED IN THE 1984 HSWA AMENDMENTS REQUIRE THAT RCRA HAZARDOUS WASTES BE TREATED TO BDAT (BEST DEMONSTRATED AVAILABLE TECHNOLOGIES) STANDARDS PRIOR TO PLACEMENT INTO THE LAND. EPA IS PROMULGATING TREATMENT STANDARDS FOR RCRA WASTES IN A PHASED APPROACH, WITH THE LAST TREATMENT STANDARD TO BE PROMULGATED IN MAY 1990.

THE ON-SITE WASTES ARE CHARACTERIZED AS RCRA WASTES FOR LEAD, ARSENIC, AND CADMIUM BECAUSE THEY EXHIBIT EP TOXICITY AS DEFINED 40 CFR 261. EPA INTENDS TO PROMULGATE BDAT STANDARDS FOR RCRA CHARACTERISTIC WASTES BY MAY 8, 1990.

EXCAVATION AND TREATMENT IN A SEPARATE UNIT IS CONSIDERED TO BE PLACEMENT UNDER RCRA LDR. THEREFORE, LDR WILL BE AN APPLICABLE/OR RELEVANT AND APPROPRIATE REQUIREMENT UPON PROMULGATION OF THE STANDARDS. HOWEVER, THE TREATMENT PROCESS WILL IMMOBILIZE THE METALS TO THE EXTENT THAT THE WASTE WILL NO LONGER BE CLASSIFIED AS A HAZARDOUS WASTE AS DEFINED BY RCRA.

3. 40 CFR PART 264 SUBPART G - CLOSURE AND POSTCLOURE

CLEAN WATER ACT/SAFE DRINKING WATER ACT

1. EPA'S DETERMINATION OF APPROPRIATE GROUND WATER CLEANUP CRITERIA INVOLVED AN EVALUATION OF CONTAMINANT CONCENTRATIONS RELATIVE TO AVAILABLE HEALTH-BASED STANDARDS. SUCH LIMITS, INCLUDING MAXIMUM CONCENTRATION LEVELS (MCLS) AND MAXIMUM CONCENTRATION LIMIT GOALS (MCLGS), AND SECTION 304 OF THE CLEAN WATER ACT (CWA) USED AS PRESCRIBED IN SECTION 121(D)(2)(B)(I) OF CERCLA, AS DEFINED BY THE SAFE DRINKING WATER ACT (SDWA) (40 CFR PART 141 AND 142) AND THE CLEAN WATER ACT, RESPECTIVELY, WILL BE MET AT THIS SITE.

2. SECTION 404(B)(1) OF THE CLEAN WATER ACT - EPA HAS ADOPTED THE GOAL OF THE NATIONAL WETLANDS POLICY FORUM TO ACHIEVE NO OVERALL NET LOSS OF THE NATION'S WETLANDS. SECTION 404(B)(1) OF THE CLEAN WATER ACT REQUIRES THAT PRACTICABLE STEPS MUST BE TAKEN TO MINIMIZE ADVERSE IMPACTS TO WETLANDS. TO ACHIEVE NO NET LOSS OF WETLANDS AT THE SITE, MITIGATION IS REQUIRED WHICH INVOLVES REPLACING WETLANDS LOST AT THE SITE BY CREATING A NEW WETLAND AREA. A SITE SPECIFIC MITIGATION

PLAN FOR THE SELECTED ALTERNATIVE WILL BE DEVELOPED IN ACCORDANCE WITH THE REGIONAL MITIGATION GUIDELINES.

FLORIDA ADMINISTRATIVE CODE CHAPTER 17-3

THE FLORIDA ADMINISTRATIVE CODE CHAPTER 17-3, MAXIMUM CONTAMINANT LEVELS (MCL) FOR CLASS III SURFACE WATER BODIES, MAY NOT BE INITIALLY MET. HOWEVER, THESE STANDARDS WILL BE ACHIEVED OVER A SHORT PERIOD OF TIME BECAUSE THE SOURCE OF CONTAMINATION (THE LANDFILL) WILL NO LONGER EXIST.

FLOODPLAIN REGULATIONS

REMEDIAL ACTION REQUIREMENTS FOR LANDFILLS ADDRESS CORRECTIVE MEASURES TO ENSURE COMPLIANCE WITH REGULATIONS REGARDING LANDFILLS LOCATED ON A 100-YEAR FLOODPLAIN.

ENDANGERED SPECIES ACT

THE SELECTED REMEDY IS PROTECTIVE OF SPECIES LISTED AS ENDANGERED OR THREATENED UNDER THE ENDANGERED SPECIES ACT. REQUIREMENTS OF THE INTERAGENCY SECTION 7 CONSULTATION PROCESS, 50 CFR PART 402, WILL BE MET. THE DEPARTMENT OF INTERIOR, FISH AND WILDLIFE SERVICE, WILL BE CONSULTED DURING REMEDIAL DESIGN TO ASSURE THAT ENDANGERED OR THREATENED SPECIES ARE NOT ADVERSELY IMPACTED BY IMPLEMENTATION OF THIS REMEDY.

FISH AND WILDLIFE COORDINATION ACT

REQUIRES ADEQUATE PROTECTION OF FISH AND WILDLIFE IF ANY STREAM OR OTHER BODY OF WATER IS MODIFIED. ADDITIONALLY, ACTIONS IN WETLANDS ARE REQUIRED TO AVOID ADVERSE EFFECTS, MINIMIZE POTENTIAL HARM, AND RESTORE AND PRESERVE NATURAL AND BENEFICIAL VALUES.

NATIONAL HISTORICAL PRESERVATION ACT

REQUIRES THAT ACTION BE TAKEN TO PRESERVE OR RECOVER HISTORICAL OR ARCHAEOLOGICAL DATA WHICH MIGHT BE DESTROYED AS A RESULT OF SITE ACTIVITIES. THERE IS NO INFORMATION TO INDICATE THAT THE KASSOUF-KIMERLING SITE CONTAINS ANY HISTORIC OR ARCHAEOLOGICAL SIGNIFICANCE.

COST-EFFECTIVENESS

THE SELECTED REMEDY IS COST-EFFECTIVE BECAUSE IT HAS BEEN DETERMINED TO PROVIDE OVERALL EFFECTIVENESS PROPORTIONAL TO ITS COSTS, THE NET PRESENT WORTH VALUE BEING $511,700. THE ESTIMATED COSTS OF THE SELECTED REMEDY ARE LESS THAN FIVE TIMES THE COSTS ASSOCIATED WITH ON-SITE CAPPING OF THE CONTAMINATED MARSH SEDIMENTS, AND THE SELECTED REMEDY ASSURES A HIGHER DEGREE OF CERTAINTY THAT THE REMEDY WILL BE EFFECTIVE IN THE LONG-TERM DUE TO THE REDUCTION OF THE TOXICITY AND MOBILITY OF THE WASTES ACHIEVED THROUGH SOLIDIFICATION OF A PORTION OF THE CONTAMINATED SEDIMENTS.

UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGY OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

EPA HAS DETERMINED THAT THE SELECTED REMEDY REPRESENTS THE MAXIMUM EXTENT TO WHICH PERMANENT SOLUTIONS AND TREATMENT TECHNOLOGIES SHOULD BE UTILIZED FOR THE FINAL OPERABLE UNIT AT THE KASSOUF-KIMERLING SITE. OF THOSE ALTERNATIVES THAT ARE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT AND COMPLY WITH ARARS, EPA HAS DETERMINED THAT THIS SELECTED REMEDY PROVIDES THE BEST BALANCE OF TRADE-OFFS IN TERMS OF LONG-TERM EFFECTIVENESS AND PERMANENCE, REDUCTION IN TOXICITY, MOBILITY, OR VOLUME ACHIEVED THROUGH TREATMENT, SHORT-TERM EFFECTIVENESS, IMPLEMENTABILITY, COST, ALSO CONSIDERING THE STATUTORY PREFERENCE FOR TREATMENT AS A PRINCIPAL

ELEMENT. SOLIDIFICATION AND STABILIZATION OF THE CONTAMINATED MARSH SEDIMENTS REPRESENTS A PERMANENT SOLUTION (THROUGH TREATMENT) WHICH WILL EFFECTIVELY REDUCE AND/OR ELIMINATE MOBILITY OF HAZARDOUS WASTES AND HAZARDOUS SUBSTANCES INTO THE ENVIRONMENT. THE REMAINDER OF THE MARSH (SEDIMENTS IN THE MARSH NOT TREATED BY SOLIDIFICATION) WILL BE CHEMICALLY BOUND AND SEQUESTERED IN THE SEDIMENTS AND WOULD NO LONGER POSE A SIGNIFICANT THREAT TO HUMAN HEALTH OR THE ENVIRONMENT.

PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

HEAVY METAL CONTAMINATION IN THE MARSH SEDIMENTS IS THE PRINCIPAL THREAT AT THE SITE. SOLIDIFICATION AND STABILIZATION IS A TREATMENT PROCESS WHICH HAS BEEN DEMONSTRATED TO EFFECTIVELY REDUCE THE MOBILITY OF HEAVY METALS IN THE ENVIRONMENT. THEREFORE, THE STATUTORY PREFERENCE FOR REMEDIES THAT EMPLOY TREATMENT AS A PRINCIPAL ELEMENT IS SATISFIED.

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RESPONSIVENESS SUMMARY

THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION (FDER) AND THE US ENVIRONMENTAL PROTECTION AGENCY (EPA) ESTABLISHED A PUBLIC COMMENT PERIOD FROM FEBRUARY 12, 1990 THROUGH MARCH 14, 1990 FOR INTERESTED PARTIES TO COMMENT ON FDER'S AND EPA'S PROPOSED REMEDIAL ACTION PLAN (PRAP) FOR THE SECOND OPERABLE UNIT (THE MARSH) ON THE KASSOUF-KIMERLING BATTERY SITE. THE COMMENT PERIOD FOLLOWED A PUBLIC MEETING ON FEBRUARY 21, 1990 CONDUCTED BY FDER AND EPA HELD AT THE OAK PARK COMMUNITY CENTER IN TAMPA, FLORIDA. THE MEETING PRESENTED THE RESULTS OF THE STUDIES UNDERTAKEN ON THE MARSH AND THE PREFERRED REMEDIAL ALTERNATIVE.

A RESPONSIVENESS SUMMARY IS REQUIRED BY SUPERFUND POLICY TO PROVIDE A SUMMARY OF CITIZEN COMMENTS AND CONCERNS ABOUT THE SITE, AS RAISED DURING THE PUBLIC COMMENT PERIOD, AND THE RESPONSES TO THOSE CONCERNS. ALL COMMENTS SUMMARIZED IN THIS DOCUMENT HAVE BEEN FACTORED INTO THE FINAL DECISION OF THE PREFERRED ALTERNATIVE FOR CLEANUP OF THE KASSOUF-KIMERLING BATTERY SITE.

THIS RESPONSIVENESS SUMMARY FOR THE KASSOUF-KIMERLING BATTERY SITE IS DIVIDED INTO THE FOLLOWING SECTIONS.

I. OVERVIEW THIS SECTION DISCUSSES THE RECOMMENDED ALTERNATIVE FOR REMEDIAL ACTION AND THE PUBLIC REACTION TO THIS ALTERNATIVE.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS THIS SECTION PROVIDES A BRIEF HISTORY OF COMMUNITY INTEREST AND CONCERNS REGARDING THE KASSOUF-KIMERLING BATTERY SITE.

III. SUMMARY OF MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND FDER'S OR EPA'S RESPONSES THIS SECTION PRESENTS BOTH ORAL AND WRITTEN COMMENTS SUBMITTED DURING THE PUBLIC COMMENT PERIOD, AND PROVIDES THE RESPONSES TO THESE COMMENTS.

IV. REMAINING CONCERNS THIS SECTION DISCUSSES COMMUNITY CONCERNS THAT EPA SHOULD BE AWARE OF IN DESIGN AND IMPLEMENTATION OF THE SECOND OPERABLE UNIT (THE MARSH).

I. OVERVIEW

THIS OPERABLE UNIT IS THE FINAL ACTION OF TWO OPERABLE UNITS FOR THE SITE. THE FIRST OPERABLE UNIT WILL ADDRESS THE SOURCE OF THE CONTAMINATION BY EXCAVATING, STABILIZING AND SOLIDIFYING THE LANDFILL WASTES AND CONTAMINATED UNDERLYING SOILS. THE SECOND OPERABLE UNIT ADDRESSES THE CONTAMINATED MARSH SEDIMENTS ADJACENT TO THE LANDFILL. THE MARSH WAS DETERMINED TO BE A PRINCIPAL THREAT AT THE SITE BECAUSE OF THE POTENTIAL THREAT OF DIRECT CONTACT WITH THE

SEDIMENTS AND THE IMPACT ON SURFACE WATER. BOTH OPERABLE UNITS WILL BE IMPLEMENTED AT THE SAME TIME.

THE MAJOR COMPONENTS OF THE RECOMMENDED ALTERNATIVE FOR THE SECOND OPERABLE UNIT (ADJACENT MARSH) INCLUDE:

- EXCAVATION AND TREATMENT BY SOLIDIFICATION, OF CONTAMINATED MARSH SEDIMENTS WITHIN 20 FEET OF THE LANDFILL AND TO A DEPTH OF TWO FEET BELOW THE SEDIMENT SURFACE.

- EXCAVATION AND TREATMENT BY SOLIDIFICATION, OF CONTAMINATED MARSH SEDIMENTS IN THE CANAL EAST OF THE SITE EXTENDING 150 FEET FROM THE LANDFILL AND TO A DEPTH OF TWO FEET BELOW THE SEDIMENT SURFACE.

- THE REMAINDER OF THE MARSH SEDIMENTS (SEDIMENTS GREATER THAN 20 FEET AWAY FROM THE LANDFILL AND SEDIMENTS GREATER THAN 150 FEET IN THE CANAL) WOULD BE LEFT IN PLACE WITHOUT TREATMENT.

- THE CANAL WHICH CURRENTLY ALLOWS THE MARSH TO DRAIN WILL BE DESIGNED TO ALLOW THE MARSH TO REMAIN FLOODED YEAR ROUND, CHANGING THE WETLAND'S HYDROPERIOD FROM A SEMI-PERMANENTLY FLOODED MARSH SYSTEM TO A PERMANENTLY FLOODED MARSH SYSTEM.

- DISPOSAL OF THE TREATED SEDIMENTS ON-SITE WITH THE TREATED LANDFILL WASTES.

- MITIGATION TO COMPENSATE FOR THE WETLANDS THAT HAVE BEEN ADVERSELY IMPACTED BY THE SITE BY ENLARGING THE EXISTING WETLANDS.

- A WAIVER OF THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC) IS REQUIRED FOR THE SURFACE WATER. THE WAIVER IS JUSTIFIED BY THE POTENTIAL NEGATIVE ENVIRONMENTAL IMPACT THAT COULD BE CREATED BY TRYING TO REMEDIATE THE REMAINDER OF THE MARSH SEDIMENTS WHICH INVOLVES COMPLETE DESTRUCTION OF THE WETLAND AND POTENTIAL MOBILIZATION OF LEAD BEYOND THE SITE AREA (CERCLA 12L(D)(4)(B)).

THE COMMUNITY, IN GENERAL, FAVORS THE SELECTION OF THE RECOMMENDED ALTERNATIVE.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERN.

THE TAMPA COMMUNITY HAS BEEN AWARE OF THE CONTAMINATION PROBLEM AT THE KASSOUF-KIMERLING BATTERY SITE FOR SEVERAL YEARS. THE FIRST PUBLIC MEETING WAS HELD ON SEPTEMBER 26, 1985 TO PRESENT, TO THE PUBLIC, THE WORK PLAN FOR THE REMEDIAL INVESTIGATION (RI) AND THE FEASIBILITY STUDY (FS). THE MEETING WAS CONDUCTED BY THE PRP'S AT THE BOARD ROOM OF THE HILLSBOROUGH COUNTY BOARD OF COMMISSIONERS IN THE HILLSBOROUGH COUNTY COURTHOUSE.

FDER AND EPA CONDUCTED THE SECOND PUBLIC MEETING ON MARCH 8, 1989 FOR THE FIRST OPERABLE UNIT (THE LANDFILL). THE PURPOSE OF THIS MEETING WAS TO EXPLAIN THE RESULTS OF THE SITE STUDIES, TO PRESENT THE RECOMMENDATIONS OF FDER AND EPA FOR SITE CLEANUP AND TO ACCEPT QUESTIONS AND COMMENTS FROM THE PUBLIC ON ANY ASPECT OF THE SITE OR ITS CLEANUP. THE RECORD OF DECISION FOR THE LANDFILL PORTION OF THE SITE WAS SIGNED ON MARCH 31, 1989.

A THIRD PUBLIC MEETING WAS HELD ON SEPTEMBER 6, 1989 FOR THE SECOND OPERABLE UNIT (THE MARSH) AT THIS MEETING, REPRESENTATIVES FROM EPA AND THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATIONS (FDER) ANSWERED QUESTIONS ABOUT THE SITE AND THE PROPOSED REMEDY FOR THE MARSH.

AFTER THE MEETING, EPA AND FDER AGREED THAT A WETLAND IMPACT STUDY (A STUDY TO FURTHER DEFINE THE ECOLOGICAL IMPACT ON THE MARSH) SHOULD BE CONDUCTED BEFORE SELECTING AN ALTERNATIVE FOR THE

MARSH. EPA'S WETLAND IMPACT STUDY WAS COMPLETED IN LATE JANUARY 1990 AND A COPY WAS PLACED IN THE PUBLIC INFORMATION REPOSITORY ON FEBRUARY 9, 1990. A MODIFIED PROPOSED PLAN WHICH REVISED THE REMEDY EPA HAD PROPOSED IN ITS INITIAL PROPOSED PLAN, WAS PLACED IN THE PUBLIC INFORMATION REPOSITORY ON FEBRUARY 9, 1990. THE PUBLIC COMMENT PERIOD ON THE MODIFIED PROPOSED PLAN WAS HELD FROM FEBRUARY 12 - MARCH 14, 1990. ON FEBRUARY 21, 1990, A PUBLIC MEETING WAS HELD TO PRESENT THE ALTERNATIVES FOR THE MARSH. AT THIS MEETING, NO CONCERNS WERE VOICED BY THE PUBLIC. HOWEVER, AFTER THE MEETING A LOCAL NEWSPAPER WROTE AN ARTICLE CRITICIZING THE FACT THAT THE STATE AND THE FEDERAL AGENCIES WANTED A WAIVER OF THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC) FOR THE SURFACE WATER IN THE MARSH. THE WAIVER IS JUSTIFIED BY THE POTENTIAL NEGATIVE ENVIRONMENTAL IMPACT THAT COULD BE CREATED BY TRYING TO REMEDIATE THE REMAINDER OF THE MARSH SEDIMENTS WHICH INVOLVES COMPLETE DESTRUCTION OF THE WETLAND AND POTENTIAL MOBILIZATION OF LEAD BEYOND THE SITE AREA.

III. SUMMARY OF MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND FDER'S OR EPA'S RESPONSES.

1. THE RESPONSIBLE PARTIES COMMENTED THAT THE ENTIRE MARSH SHOULD NOT BE MITIGATED AND THAT THE MARSH WAS NOT ADVERSELY IMPACTED.

EPA RESPONSE: BASED ON THE WETLAND IMPACT STUDY, EPA AND THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION (FDER) AGREED THAT THE CONTAMINATED SEDIMENTS REMAINING IN THE MARSH WILL CONTINUE TO IMPAIR THE BIOLOGICAL PRODUCTIVITY AND DIVERSITY OF THE WETLANDS ECOSYSTEM. TO MINIMIZE THE EFFECTS OF THIS IMPACT, MITIGATION IS REHIRED TO CREATE NEW AREAS OF WETLANDS THAT WILL REPLACE THE FUNCTIONS LOST IN THE ON-SITE WETLAND.

2. ONE COMMENTER INQUIRED ABOUT THE WAIVER OF THE FEDERAL AMBIENT WATER QUALITY CRITERIA (AWQC) FOR THE SURFACE WATER IN THE MARSH.

EPA RESPONSE: A WETLAND IMPACT STUDY WAS CONDUCTED BY EPA TO CONSIDER THE RISK TO THE ECOLOGY OF THE MARSH (PLANTS, FISH, BIRDS, ECT.). THE REPORT CONCLUDED THAT TRYING TO CLEANUP ALL OF THE MARSH SEDIMENTS MAY RESULT IN THE MOBILIZATION OF LEAD, WHICH WOULD ULTIMATELY HAVE A GREATER NEGATIVE ENVIRONMENTAL IMPACT ON THE MARSH. MOBILIZATION OF LEAD COULD BE CAUSED BY THE USE OF HEAVY EARTH MOVING EQUIPMENT MIXING THE MARSH SEDIMENTS AND FORCING THE CONTAMINANTS DEEPER INTO THE PEAT SEDIMENTS. SIMILARLY, THE VOID FORMED AS THE VEGETATION IS REMOVED FROM THE ROOT ZONE COULD ALLOW THE CONTAMINANTS TO MOVE DEEPER. THE EARTH MOVING EQUIPMENT COULD SUSPEND LEAD PARTICULATES THAT ARE BOND TO THE MARSH SEDIMENTS, INTO THE WATER COLUMN THUS ALLOWING LEAD TO MIGRATE FROM THE MARSH. THEREFORE, THE EPA AND FDER RECOMMEND THAT ONLY VERY HIGH CONCENTRATIONS OF LEAD ALONG THE EDGE OF THE LANDFILL AND THE SEDIMENTS IN THE CANAL BE TREATED. ALTHOUGH THIS REMEDY CALLS FOR A WAVIER OF THE FEDERAL AMBIENT WATER QUALITY CRITERIA FOR SURFACE WATER, IT WOULD MEET ALL HUMAN HEALTH STANDARDS FOR SURFACE WATER.

IV. REMAINING CONCERNS

THE COMMUNITY'S CONCERNS SURROUNDING THE KASSOUF-KIMERLING BATTERY SITE WILL BE ADDRESSED IN THE FOLLOWING AREAS: COMMUNITY RELATIONS SUPPORT THROUGHOUT THE REMEDIAL DESIGN/REMEDIAL ACTION, AND INCORPORATION OF COMMENTS/SUGGESTIONS IN THE REMEDIAL DESIGN.

COMMUNITY RELATIONS SHOULD CONSIST OF MAKING AVAILABLE FINAL DOCUMENTS (I.E. REMEDIAL DESIGN WORK PLAN, REMEDIAL DESIGN REPORTS, ECT.) IN A TIMELY MANNER TO THE LOCAL REPOSITORY AND ISSUANCE OF FACT SHEETS TO THOSE ON THE MAILING LIST TO PROVIDE THE COMMUNITY WITH PROJECT PROGRESS AND A SCHEDULE OF EVENTS. THE COMMUNITY WILL BE MADE AWARE OF ANY PRINCIPAL DESIGN CHANGES MADE DURING PROJECT DESIGN. AT ANY TIME DURING THE REMEDIAL DESIGN OR REMEDIAL ACTION, IF NEW INFORMATION IS REVEALED THAT COULD AFFECT THE IMPLEMENTATION OF THE REMEDY OR, IF THE REMEDY FAILS TO ACHIEVE THE NECESSARY DESIGN CRITERIA, THE RECORD OF DECISION MAY BE REVISED TO INCORPORATE NEW TECHNOLOGY THAT WILL ATTAIN THE NECESSARY PERFORMANCE CRITERIA.

COMMUNITY RELATIONS ACTIVITIES WILL REMAIN AN ACTIVE ASPECT OF THE REMEDIAL DESIGN/REMEDIAL ACTION PHASE OF THIS PROJECT.

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TABLE 6.6
LEAD ANALYTICAL DATA SUMMARY

SAMPLE NUMBER	LEAD CONCENTRATION (MG/KG) DEPTH INTERVAL				
	A	B	C	D	E
KK-3	330	130	38	--	--
KK-7	730	56	6.1	--	--
KK-12	360	20	4.1	--	NS
KK-17	18	6.1	--	--	NS

-- MATERIAL WAS ANALYZED FOR BUT NOT DETECTED
NS A SAMPLE WAS NOT COLLECTED FROM THIS DEPTH

A IN THE SAMPLE NUMBER INDICATES A SAMPLE COLLECTION DEPTH OF O TO 1 FOOT BELOW LAND SURFACE (BLS)

B INDICATES 1 TO 2 FEET BLS

C INDICATES 2 TO 3 FEET BLS

D INDICATES 3 TO 4 FEET BLS

E INDICATES 4 TO 5 FEET BLS

NOTE: THE APPROACH USED IN THIS INVESTIGATION WAS TO COLLECT SAMPLES FROM ONE FOOT INTERVALS THROUGH THE PEAT LAYER THEN COLLECT ONE SAMPLE INTO THE SAND UNDERNEATH THE PEAT. CONSEQUENTLY, FIVE SAMPLES WERE COLLECTED FROM LOCATIONS KK-3 AND KK-7 AND FOUR SAMPLES WERE COLLECTED FROM LOCATIONS KK-12 NAD KK-17. THE PEAT LAYER AT LOCATION KK-17 WAS LESS THAN ONE FOOT THICK. HOWEVER SAMPLES WERE COLLECTED TO A DEPTH OF FOUR FEET.

TABLE 9.1
GLOSSARY OF EVALUATION CRITERIA

OVERALL PROTECTION OF HUMAN HEALTH AND ENVIRONMENT - ADDRESSES WHETHER NOR NOT A REMEDY PROVIDES ADEQUATE PROTECTION AND DESCRIBES HOW RISKS POSED THROUGH EACH PATHWAY ARE ELIMINATED, REDUCED, OR CONTROLLED THROUGH TREATMENT ENGINEERING CONTROLS OR INSTITUTIONAL CONTROLS.

COMPLIANCE WITH ARARS ADDRESSES WHETHER OR NOT A REMEDY WILL MEET ALL OF THE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OF OTHER FEDERAL AND STATE ENVIRONMENTAL STATUTES AND/OR PROVIDE GROUNDS FOR INVOLVING A WAIVER.

LONG-TERM EFFECTIVENESS AND PERMANENCE - REFERS TO THE MAGNITUDE OF RESIDUAL RISK AND THE ABILITY OF A REMEDY TO MAINTAIN RELIABLE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT OVER TIME ONCE CLEANUP GOALS HAVE BEEN MET.

REDUCTION TO TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT IS THE ANTICIPATED PERFORMANCE OF THE TREATMENT TECHNOLOGIES THAT MAY BE EMPLOYED IN A REMEDY.

SHORT-TERM EFFECTIVENESS REFERS TO THE SPEED WITH WHICH THE REMEDY ACHIEVES PROTECTION, AS WELL AS THE REMEDIES POTENTIAL TO CREATE ADVERSE IMPACTS ON HUMAN HEALTH AND THE ENVIRONMENT THAT MAY RESULT DURING THE CONSTRUCTION AND IMPLEMENTATION PERIOD.

IMPLEMENTABILITY IS THE TECHNICAL AND ADMINISTRATIVE FEASIBILITY OF A REMEDY, INCLUDING THE AVAILABILITY OF MATERIALS AND SERVICES NEEDED TO IMPLEMENT THE CHOSEN SOLUTION

COST INCLUDES CAPITAL AND OPERATION AND MAINTENANCE COSTS.

STATE ACCEPTANCE INDICATES WHETHER THE STATE CONCURS WITH, OPPOSES, OR HAS NO COMMENT ON THE PROPOSED PLAN.

COMMUNITY ACCEPTANCE THE RESPONSIVENESS SUMMARY IN THE APPENDIX OF THE RECORD OF DECISION REVIEWS THE PUBLIC COMMENTS RECEIVED FROM THE PROPOSED PLAN PUBLIC MEETING.